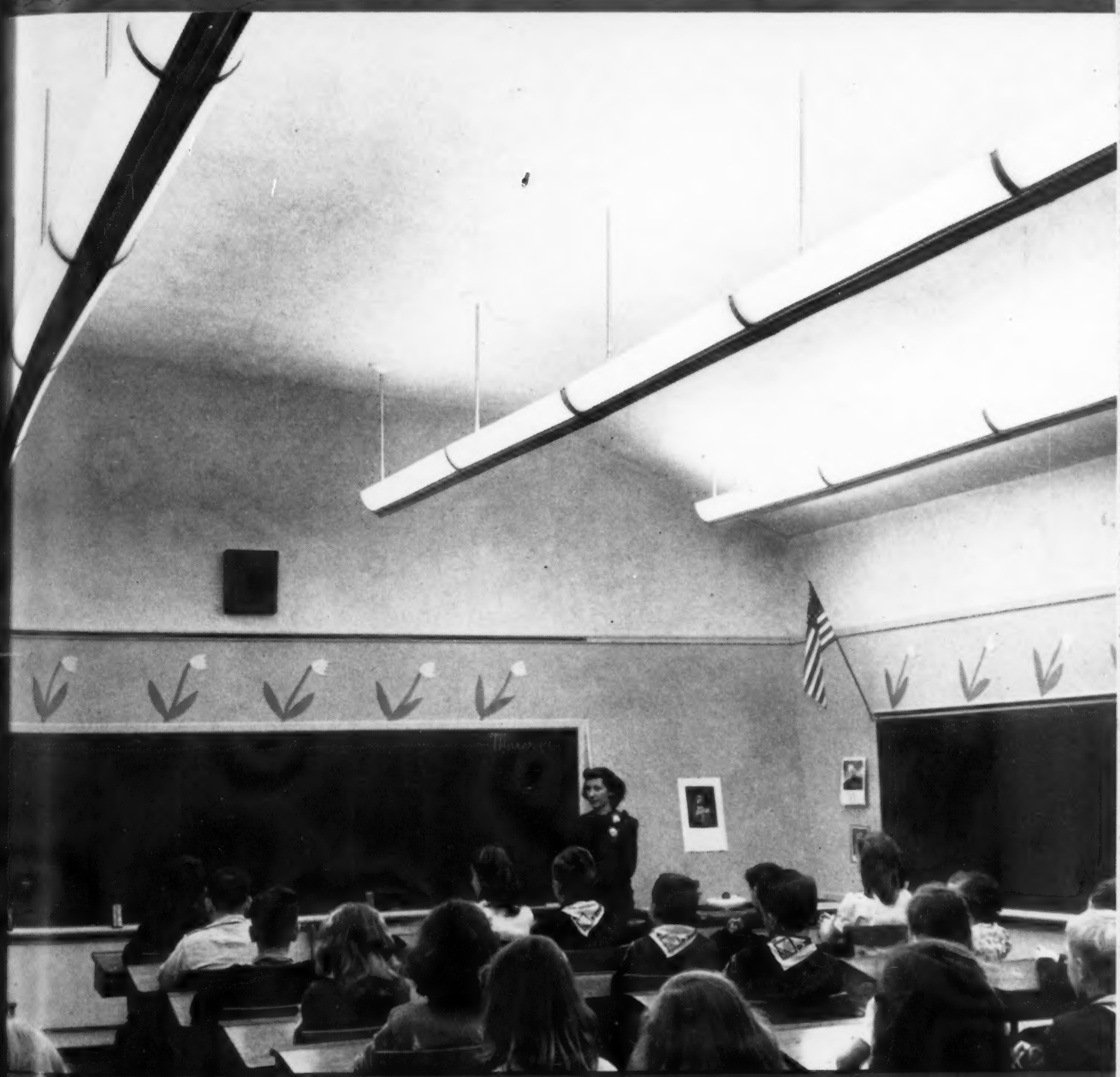
ELECTRICAL WEST

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED SECTION OF THE U. S.



ANNUAL LIGHTING ISSUE

SEPTEMBER 1946
25c A COPY

WILL THE WIRING "MEASURE UP" TO THE HOUSE
WILL YOUR HOUSE BE OUT-OF-DATE AS SOON AS IT IS BUILT?
...NOT IF IT IS PROPE
THE ELECTRIC DISHWASHER an idea for your Electric Kitchen
ADD TO ITS SELLING VALUE WITH ADEQUATE WIRING
Modern? Only if it is properly wired!
BUILT TO LOOK MODERN
BUILT TO BE MODERN
Adequate Wiring MAKES THE DIFFERENCE

"Wiring Ahead" FOR BETTER APPLIANCE SELLING

ADEQUATE WIRING stays in the spotlight with Edison! Because the owners of adequately wired homes are the best prospects for electrical appliances, Edison newspaper advertisements (some of them reproduced here) continue to promote good wiring throughout Southern and Central California. These advertisements support the activities of our recently established Electric Home Planning Department. This department's advisory services are free to home planners, architects and builders in Edison service territory. Appliance dealers in Edison territory also are cordially invited to call on us for information or assistance in the promotion of better wiring and appliance selling.

SOUTHERN CALIFORNIA EDISON COMPANY

ELECTRICAL WEST (with which is consolidated The Journal of Electricity), September, 1946. Vol. 97, No. 3. Published monthly by the McGraw-Hill Company of California, 68 Post Street, San Francisco 4, Calif. Entered as second class matter at the post office at San Francisco under the Act of March 3, 1879. Additional entry as second class matter at the post office at Los Angeles. Printed in U. S. A. Subscription rates—U. S., U. S. Possessions and Latin American Republics: $2, 1 year; $3, 2 years; $4, 3 years. Canada: $2.50, 1 year; $4, 2 years; $5, 3 years. Other countries: $3, 1 year; $5, 2 years; $6, 3 years. Single copy, 25c. Copyright, 1946. McGraw-Hill Company of California. All rights reserved.

HERE are the successors to the radial-wave reflector—two new G-E suburban reflectors that now bring scientific light distribution to the lighting of residential streets. Light formerly dissipated in non-useful directions is utilized to better advantage. Direct glare is greatly reduced. Uniformity of illumination on the road is much improved, yet installation and maintenance are easy.

Two types—open and enclosed—using series lamps of 1000- or 2500-lumen rating are available with adapters to fit practically any fixture that takes the standard-dome radial-wave reflector. They may be installed either as unit-for-unit replacements to provide better light distribution, or in accordance with I.E.S. Recommended Practice to obtain specified illumination levels at low cost.

These G-E suburban reflectors offer utilities an inexpensive way to improve suburban lighting in their communities and to keep that lighting at high efficiency for years of low-cost service. Why not check the features listed here, then ask your local G-E representative how these reflectors can fit into your suburban streetlighting plans? *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

SCIENTIFIC LIGHT CONTROL

A highly efficient light distribution pattern effectively utilizes much of the light ordinarily wasted in producing objectionable glare and illumination of house fronts.

HIGHER LIGHTING LEVELS

When equipped with the new G-E 2500-lumen lamp of 5⅜-inch light-center length and spaced as recommended, I.E.S. Standards for suburban lighting can be readily met.

USE TWO WAYS

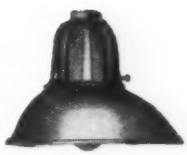
1) *In existing installations* as unit-for-unit replacements for radial-wave reflectors.

2) *In new installations* to provide higher lighting efficiency and more uniform illumination.

LOW MAINTENANCE COST

Alzak-processed aluminum reflectors retain high efficiency for years under all weather conditions, and are easily cleaned when necessary. Enclosed type has refractor spun-sealed to keep out dirt and to practically eliminate breakage.

(a) Form 79 CR luminaire with enclosed suburban reflector. Simple latches and safety chain facilitate relamping.



(b) Form 45 L luminaire with open suburban reflector. Either one or two shields may be easily attached if needed.

Are you tieing in with the NEMA plan to give America better street lighting?

Good Street Lighting
BUILDS GOOD WILL

STREET LIGHTS *for better seeing*

GENERAL ELECTRIC

452-39-3010

ELECTRICAL WEST

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Cover Photo: New lighting installation in the Ross, Calif., elementary school uses Guth indirect luminaires; gives 55 ft.-candles. Photo by Don Krogh, Pacific Gas and Electric.

CHANGE OF ADDRESS

Circulation Manager,
Electrical West,
68 Post St.
San Francisco, Calif.

Please change my address

From .....

To .....

Signed .....

People

James Moore Evans

this month contributes a supplement to last issue's index to the 1946 Electric Code. Well-versed in Code provisions, he has written on the subject before, his series on the Code and Code making having appeared in ELECTRICAL WEST earlier this year. For several years in Los Angeles, as electrical engineer for the Board of Fire Underwriters of the Pacific, Evans is now in the Bay area, with the Navy's Bureau of Yards and Docks, Area No. 6. His digest of Code changes, p. 84, is a useful supplement to the 1940-46 cross-index published in August, p. 72.

Ladner V. Ross

director of the recently formed Northwest Research Advisory Service, has been loaned to that organization by Washington Water Power Co. An Oregon State graduate in electrical engineering, he has been with WWP since 1926, first as illumination engineer and for the past several years as commercial industrial sales manager. He writes in this issue, p. 92, about the new customer service offered under sponsorship of the Northwest Electric Light & Power Assn.

Preview

Industrial Development

stimulated by the war and now reaching proportions undreamed of by even the most ardent advocates of the "manifest destiny" of the Far West, will receive special treatment in ELECTRICAL WEST for October. First there will be a comprehensive projection of the plans of utilities to provide adequate power supplies over the next three years for the rapidly expanding industrial loads. Then there will be an analysis of the character of Western industry—prewar, during the war and in the direct postwar year. Finally there will be a review of the various industrial development programs which are effectively attracting new industries to this region. In addition to this industrial section, the October issue will carry the regular departments and features.

THE RED SAFETY SIDE REST bars on each side of the General Mills Tru-Heat Iron hold the soleplate up off the board when the iron is rolled to rest on its side. Lessens the danger of iron tipping or falling.

It's safe...it rests on its side!

The General Mills Tru-Heat Iron on its Safety Side Rest is 87% more stable than an iron tipped up on a heel rest . . . safer because it hugs the board on broad, low supports. And the natural easy motion of rolling it to rest on its side takes 15% less energy than pulling an iron up on its heel.

Safety Side Rest is just *one* feature...there's Tru-Heat Control, which reacts faster to changes in temperature than ordinary types of iron heat regulators...the scientifically shaped 4-Way, Full-Vue Ironing Surface with more working area than any of five leading makes...the Tru-Heat Fabric Selector with both fabric and temperature settings. Each adds ease and speed to ironing—and selling!

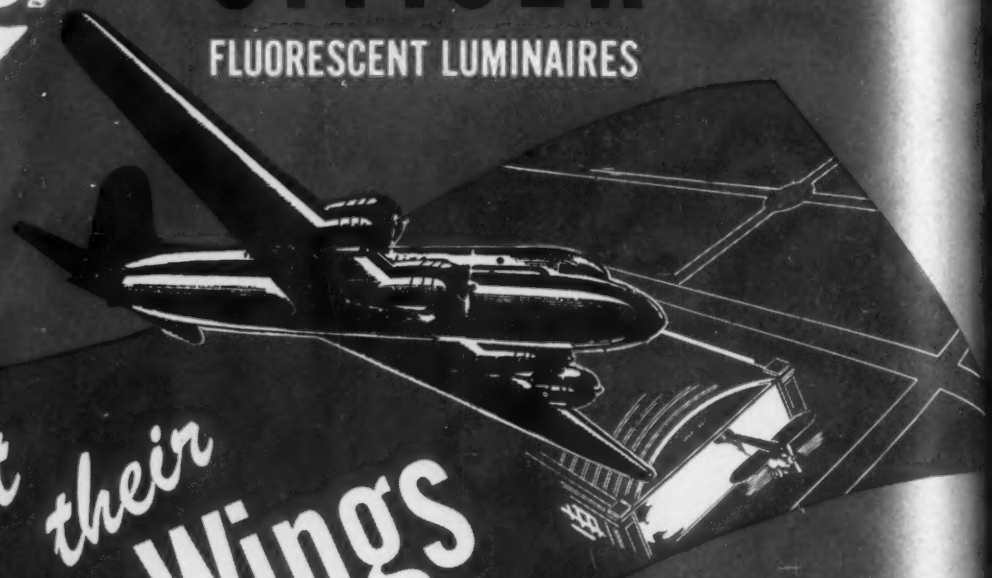
NOW BEING DISTRIBUTED IN: Minnesota, Nebraska, the Dakotas, Wisconsin, Upper Michigan, Montana, Idaho, Wyoming, Utah, Colorado, New Mexico, and parts of Illinois and Indiana. Other states to follow soon! General Mills, Inc., Home Appliance Dept., Minneapolis 13, Minn.

THE IRON SPONSORED BY Betty Crocker

Betty Crocker is a trade name of General Mills, Inc.

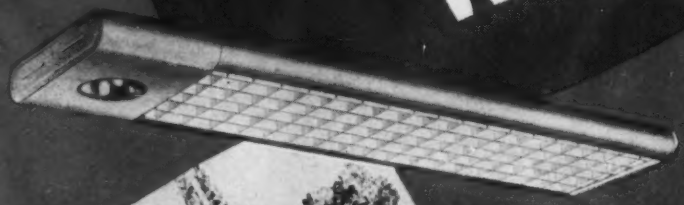
Leader "OFFICER"

FLUORESCENT LUMINAIRES



Get their Wings

..... Yes, "OFFICER"

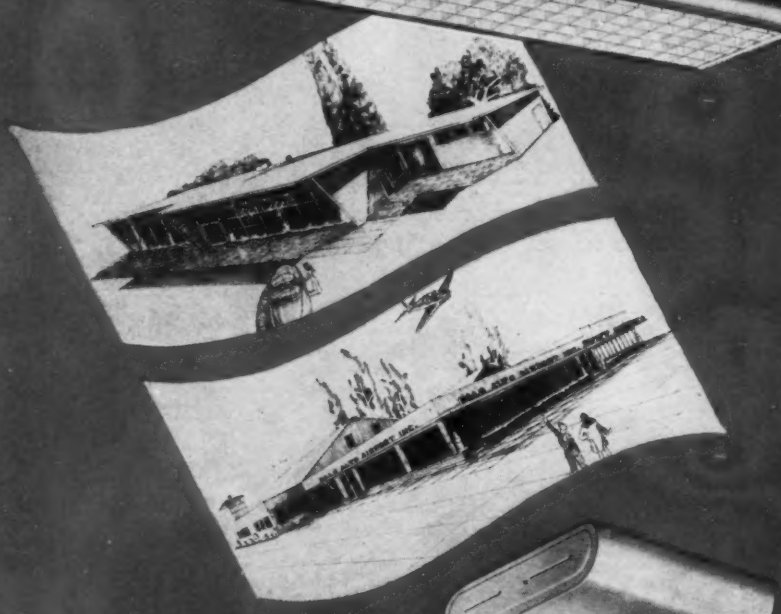


Fluorescents are getting their wings. Pictured here are architectural drawings of the new Palo Alto, California, airport. Leader "Officer" fixtures are specified throughout.

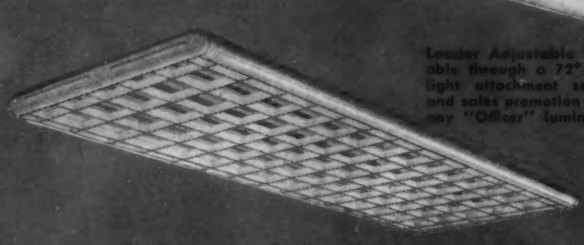
Leader "Officer" luminaires are meeting with unqualified approval everywhere. Their streamlined, wafer-thin beauty scores a new triumph in lighting circles.

"Officer" installations invariably bring distinction and better appearance to any store, office or institution in which they are installed. They offer new illuminating efficiency and a new high in performance.

No matter what your lighting problem, there is a Leader fluorescent fixture that will give you complete satisfaction. Only better electrical wholesalers have Leader franchises. There is a Leader representative in your area. See him today, or write



Leader Adjustable "Directite" . . . Fully adjustable through a 72° arc, this remarkable spotlight attachment serves many merchandising and sales promotion needs. Easily installed with any "Officer" luminaire.



Leader "Officer" VL-440 . . . Here is pleasing diffusion without sacrifice of light output. Architects, engineers, interior decorators all acclaim the "Officer."

LEADER ELECTRIC MANUFACTURING CORP., 6127 N. BROADWAY, CHICAGO 40, I

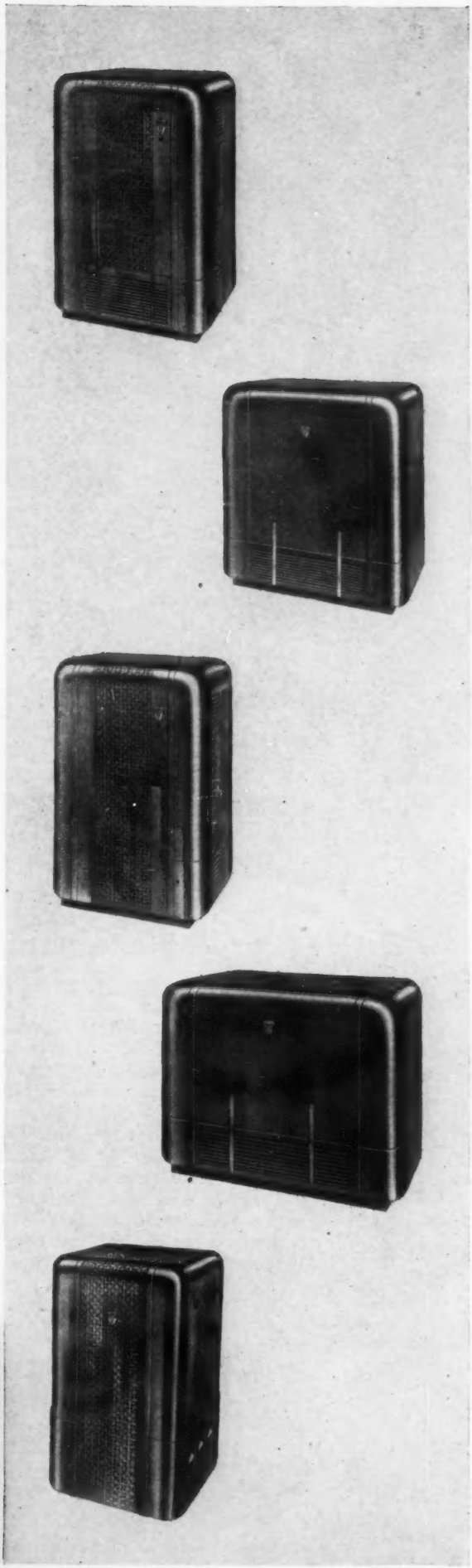
WEST COAST FACTORY
2040 LIVINGSTON STREET, OAKLAND 6, CALIF.

MODERN HEAT IN THE MODERN PACKAGE

It's a new, modern market that's wide open for unheard of volume in sales, and the wise dealer of today doesn't want to meet it with yesterday's merchandise. No, it takes modern ideas to sell the modern market. And Silent Sioux is ready with a complete, new line of automatic oil heaters. Yes, modern heat in the modern package. New features in design and construction . . . features that mean greater safety, comfort and convenience to your customers . . . all designed to sell the modern market.

With present shortages, our production is far short of what we and our dealer demand would like it to be. We can't sacrifice quality for quantity, and we refuse to mislead dealers with false promises of so-called early delivery dates. Until sheet steel becomes more plentiful, production will be limited. However, all specifications and illustrations of these new models are available in our new portfolio. So write today for your free copy and see for yourself the many advantages of this new Silent Sioux line.

SILENT SIOUX OIL BURNER CORPORATION, ORANGE CITY, IOWA.



Silent Sioux

PIONEERS IN GOOD HEATING

Fast

Easy to Clean

Economical

Long Life

For Replacement on any Make or Size Electric Range

You'll find profit and pleasure in recommending CHROMALOX *Triangulars* to your customers. They install in a jiffy without muss or fuss and they give you a good mark-up and fast turn-over.

There is plenty of sales punch in CHROMALOX *Triangular* Range Units! They provide instant heat . . . long and dependable service . . . and make cooking really enjoyable to housewives.

Extra Volume and Extra Profits are yours when you feature CHROMALOX *Triangulars* for range unit replacements. For full information, write for Catalogs CF-145 and L-1023-A.

on new ranges and for replacements

CHROMALOX
means *ELECTRIC* Cooking at Its Best

RC-17

EDWIN L. WIEGAND COMPANY, 7540 Thomas Blvd., Pittsburgh 8, Pa.
MONTGOMERY BROS., 1122 Howard Street, San Francisco 3, Calif.; 911 Western Ave., Seattle 4, Wash.; 2333 N. W. Westover St., Portland 10, Oregon; 741 E. Eighth St., Los Angeles 21, Calif.; THE PETERSON CO., 1921 Blake St., Denver 2, Colo.

PRODUCTS

that are news

Travel Iron (900)

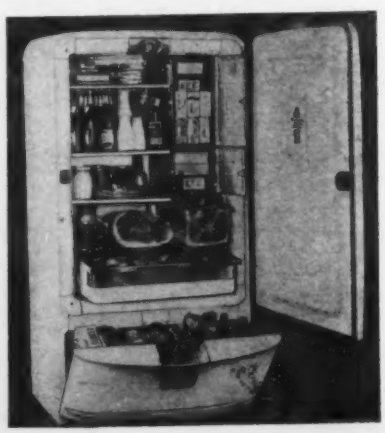
G-E is again producing its travel iron. This 2-lb. iron has a soleplate designed to give heat without weight and plated to resist salt-air corrosion. The folding handle has two thumb rests and can be used in either hand. The plug is reversible so that the cord will not drag over the ironing surface. The iron fits into a zippered carrying case.

Range (901)

Norge is offering a new electric range, Model E-450, with timing devices which will automatically turn on and off oven, deep-well cooker or convenience outlet. The 6-qt. deep-well cooker has a 1,200-watt heat unit. Other top range units: one 2,000-watt and two 1,200-watt burners. Oven wattage is adjustable, has a total of 4,000 watts in top and bottom units. Two utensil drawers and a warmer drawer are provided.

Refrigerator (902)

Recently announced in the Norge refrigerator line are three 7-cu. ft. and one 9-cu. ft. model and a lower priced 7.10-cu. ft. machine. The 7-ft. model pictured, LFN-746, holds up to 31½ lb. of frozen food, has automatic defrosting, "coldpack" for 7 to 12 lb. of meat, full-width "hydrovoir" and a tilting bin for canned goods.



Now CRESCENT WIRES AND CABLES

Conforming to the 1946 National Electrical Code

GIVE YOU THE FOLLOWING ADVANTAGES

IMPROVED INSULATION

CRESCENT Building Wire—Type R, Code grade and Type RW Moisture Resisting grade employ improved rubber insulation resulting in even longer life that permits a 60° C. maximum operating temperature instead of 50° C. as in the past.

SMALLER DIAMETER

Sizes #14 and #12 A.W.G., Types R and RH, employ a 1/32nd inch wall of insulation that gives a considerably smaller wire permitting more copper and current carrying capacity for the same size conduit, for rewiring.

GREATER CURRENT-CARRYING CAPACITY

The use of CRESCENT ENDURITE Type RH Heat Resisting Cables in sizes #1 A.W.G. and heavier is recommended as they give the lowest cost per ampere of useful installed capacity and longest life.

EASIER TO INSTALL

CRESFLEX—Nonmetallic Sheathed Cable is smaller, lighter and easier to install in sizes #14 and #12 A.W.G.

CRESCENT WIRE AND CABLE

NEMA

CRESCENT INSULATED WIRE & CABLE CO., TRENTON, N. J.

RAY MURPHY CO., 720 E. 2nd ST., LOS ANGELES 12, CAL.
ELECTRIC AGENCIES, SUITE 619-620 MUTUAL LIFE BLDG., 605 FIRST AVE., SEATTLE 4, WASH.

HE WAS JUST AS HOT AT SIWASH

...but no one ever heard of him!

A whizzeroo on a small-time team, "Moose" McGinty was unknown till he turned pro. Today, with expert quarterbacking, behind a world-champion line, with big-time interference cloaking his end-sweeps, with the best throwing arm in the business rifling passes to him—today McGinty is Mister Football! For a strong team makes a good man great.

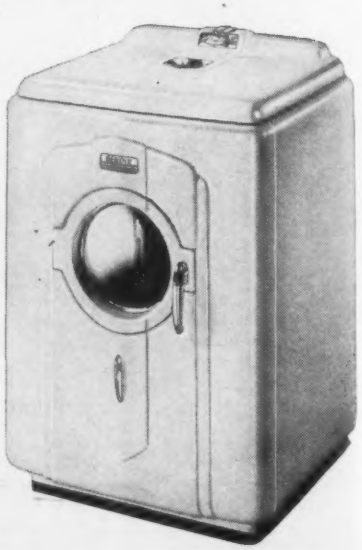
It's the same in selling automatic washing machines! A good dealer is still better when he's on the world champion BENDIX team!

For here you have everything to help you put yourself across. Here you have the BENDIX, the first and still the best of the automatic washers . . . a machine with nine years of tested dependability . . . the "world's most wanted washer" as survey after survey shows. Powerful promotional backing, national advertising, outdoor posters, local newspaper ads, movies and radio commercials—all tied together in a smooth-working program by one of the greatest merchandising organizations in the appliance industry.

On a team like that YOU are Mister Automatic Washer!

© Bendix Home Appliances, Inc.

BENDIX
automatic
Home Laundry



ELECTRICAL WEST Sales Guide

NEWS LETTER FOR THE ELECTRICAL MERCHANT OF THE WEST

September
1946
©

The Certified Lamp Manufacturers plan to do heavy advertising in 1947 to familiarize the public with the Certified lamps, (floor and table) which are the successors to the IES type. There will be no more IES, since the Illuminating Engineering Society felt its professional status was being commercialized. Instead, it developed standards, but the manufacturers must develop the certification program. One hundred are doing so in the association.

New lamp tag

Phil Spitalny and the all-girl Hour of Charm orchestra will leave G-E Lamps and take the place of Nelson Eddy on the Electric Hour sponsored by the utility companies.

All-girl

Back with OPA came its RMPR-165, and regulation of service charges for refrigerators, small commercial and industrial too. Wage raises are back under regulation too. If you run a service shop, better get the rules and try to decipher them. They are complicated but if you miss, as a business man you are the goat.

RMPR-165 back

Automatic Washer Co. will manufacture the vacuum cleaners for the McAllister-Ross Corp. of Chicago. It won't interfere with the making of its washers, Neal Gallagher declares.

Both

Harper-Meggee of Seattle has been teaching home demonstrating of Bendix washers to its 14 Alaskan dealers by mail.

Mail call

Simmons electronic blankets now have Underwriters approval, have been laundry-tested by the American Institute of Laundering, and are going on sale through dealers under Fair Trade Acts with a minimum retail price of $39.50 plus federal and sales taxes.

Blankets approved

Electromatic Mfg. Corp. of New York City is making a table top line of Coluratone combination radio and automatic record changing players which it is promoting with a "piano test" offer to demonstrate its reproduction qualities.

Piano test

Arthur C. Jordan, of Federal Telephone & Radio Corp., Newark, was West setting up distribution for the new line of radios the company has decided to make after all, beginning this fall.

To go ahead

Bendix Radio Division of Bendix Aviation (not the washer) has taken a license to make television receivers for color television under the Columbia Broadcasting System patents. — Color video

Presteline ranges will have a new cook book and instruction manual, called "Cooking with Imagination", which its makers, Pressed Steel Car Co., say strikes an entirely different note from previous cookbooks. The cookbook is designed to be a sales aid in itself. — On non-existent ranges?

A novel new electric heater, the Electro-Jet, is being made by Ravenna Metal Products Co. at 6518 Ravenna Ave., Seattle. It comes either in a model to be built in to the wall or affixed to it. It employs the venturi principle to speed up air flow along its concealed, black heat strips. — New idea

Treasure State Gas & Electric of Butte has been made distributor for Stewart-Warner in Montana. — Montana

Walter Boland, electronics district manager for the West for General Electric, returned recently from the factories with news of G-E's new F-M line, its re-engineered Musaphonic radio-phonograph combinations which are to reach dealers in September. In the future a super combination with television, F-M, A-M, and a record player is promised, to sell at about $475. — New features

Acme Laboratory Equipment Co. of New York has brought out a two-gallon, non-pressure type automatic electric water heater, UL listed, operating on 110-volt a.c., similar to those commonly used in England, for over-the-sink mounting. Says there's a good market in small homes, summer cottages, business offices, service stations. — English type

Stewart-Warner has adapted its aircraft heater to a small home heating unit and will be in production with it for the fall and winter market. — Air to home

Los Angeles Times and San Francisco Chronicle have been given permits to install television stations. — Soon

Conlon Corp. of Chicago will make the Wizard washing machine and ironer for Western Auto Supply Co. — Deal

Burkaw Electric Co. of New York City, an old timer in making electric heaters, floor polishers, phonographs, home recording units and amplifiers, has changed management and may add new products to its line. Distribution is through manufacturers' representatives direct to dealers. The Spector Co., of San Francisco, is its Western representative. — New blood

Kellet Aircraft Corp. of Philadelphia has formed a subsidiary, Coldaire Corp. to make frozen food cabinets. — Freezer

Noma, still expanding, will convert the factory of Pollak Manufacturing Co., which it recently merged with, to enlarge the capacity for making its now owned Estate Stove Co. and Refrigeration Corp. products. — Still expands

Only Monarch . . .

has the Electric Roaster Range with "Deep-Heet" surface oven built into the cooking top.

Only Monarch . .

has the "Deep-Heet" Sauce Pan which has both side and bottom heat.

Only Monarch . .

has the "Deep-Heet" Cooker with side application of heat —a six-quart insulated surface oven.

Only Monarch . .

has a Coal-Wood-Electric Range with "DUO-OVEN" equipped with Oven Temperature Control. (Electricity supplements coal-wood fire to maintain uniform temperature.)

YES, the Monarch Line gives you cooking conveniences to sell that are *100% exclusive* . . . cooking conveniences which will keep your customers *permanently happy* that they bought a Monarch . . . *happy* that they made their purchase at YOUR store.

MALLEABLE IRON RANGE COMPANY
3996 Lake Street Beaver Dam, Wis.

I thought I was dreaming!
A TOUCH HERE LIFTS IT
A TOUCH HERE AND IT'S READY TO IRON
HEADLIGHT
Until I saw the light . . .
NO LIFT—NO TILT—NO TWIST

then I knew PROCTOR had a new Deluxe *NEVER-LIFT!*

There they were! Those handsome, eye-catching Proctor Deluxe Never-Lifts! . . . "Baby," said I to myself, "This is *some* dream." But imagine my surprise . . . it was no dream. The Proctor Deluxe Never-Lifts are actually on the way.

The Proctor Deluxe Never-Lift is an exclusive, streamlined pushbutton iron with a headlight *plus all* the other Proctor Never-Lift features . . . *Even Heat, Cool Legs, Fabric Dial, Speed Selector, Built-in Cord.*

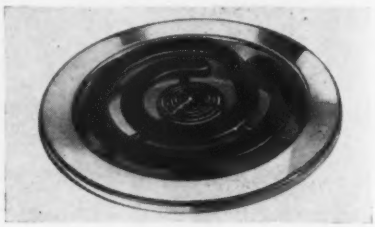
The Never-Lift's sales story is easy to tell—in fact it almost tells itself.

PROCTOR *NEWSMAKER IN APPLIANCE MERCHANDISING*

PROCTOR ELECTRIC COMPANY, PHILA. 40, PA.

Surface Unit (903)

Tuttle & Kift has designed an electric range surface unit, which is constructed of a single coil, has a single anchorage. Called the Thermo-Kleen Monotube, this unit has been put through laboratory tests equivalent to 15 years normal service without deviation in coil flatness, the manufacturer states. It is available now to manufacturers for new ranges and will be supplied later to dealers for replacement installation.



Heater (904)

Electro-Jet, for residential and commercial heating, is offered by Ravenna Metal Products Co. in wattages ranging from 750 to 2,500. According to the manufacturer, one watt per cubic foot is adequate for average well-insulated rooms, unless there is an unusual amount of window space.

In operation, cold air is drawn in at the bottom vent, passes over low-temperature heating elements, rises rapidly and, upon reaching the top of the Jet, mixes with the cooler air being drawn up in the outer casing. Warm air is thus forced out of the grill at a velocity up to 240 ft. per min., it is stated.

Two models are available: the AL for installation in the wall and the BL, which is mounted outside of the wall. Individual heating strips are supplied in capacities of 750, 1,000 and 1,250 watts and either one or two elements may be used. Heaters operate on 220 volts at 4.6 amp. per 1,000 watts and it is claimed that elements do not exceed 400°F. Provision is made for entrance of 16% fresh air if desired. A dust filter may be procured as extra equipment. Twin-thermostat control is recommended by the manufacturer.

Milk Coolers (905)

Westinghouse is making electrically operated milk coolers in four cabinet sizes to handle three, four, five or six standard 10-gal. milk cans. Thirty-five to 40 gallons of water, chilled by a hermetically sealed refrigeration unit, are circulated each minute around the outside of the cans. The cooling equipment is built as a single unit. Cooling units called "drop-in" coolers are sold separately to farmers who have cabinets with adequate insulation.

Strain Relief (906)

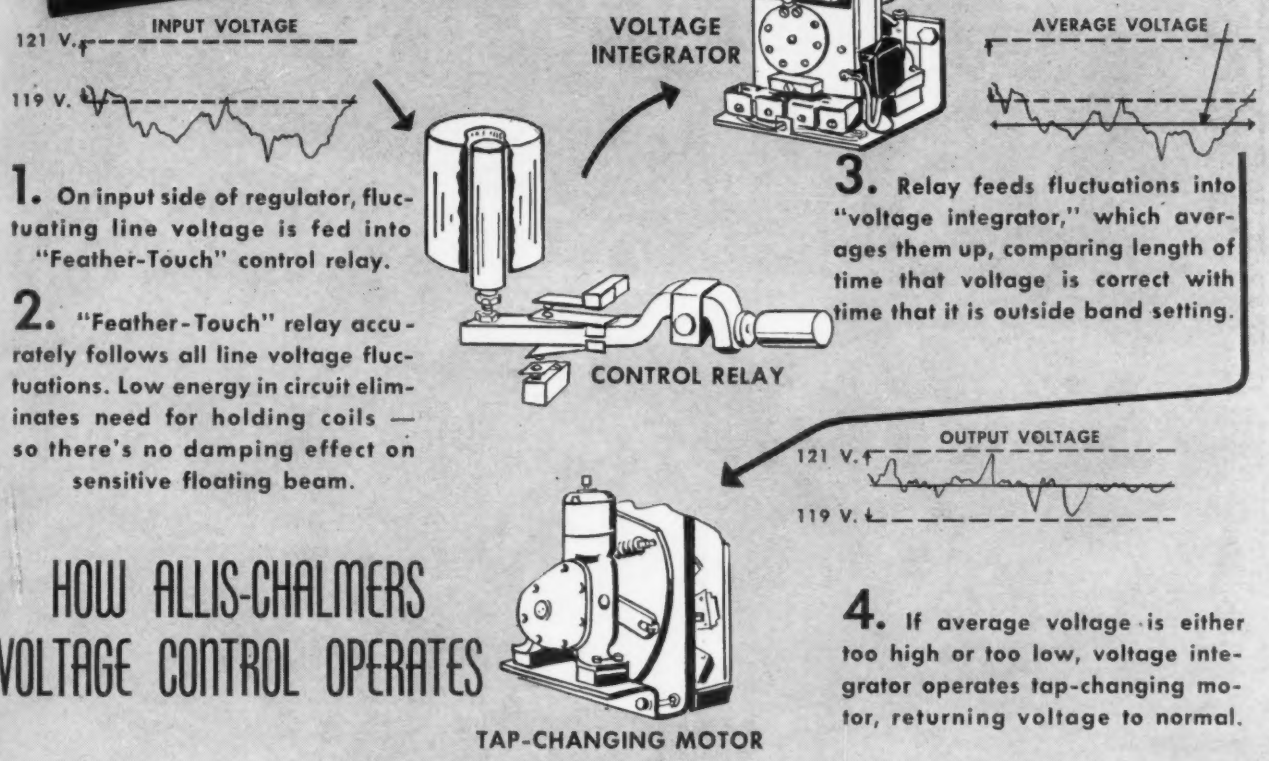
Heyman Mfg. Co. is offering a strain relief designed to absorb pull, push and torque from the appliance cord set and to eliminate strain on terminals. This device is molded from plastic and is claimed not to injure insulation or wire.

Portable Heater (907)

Electromode Corp. is making a new portable electric heater for large rooms in home, office or plant. This heater is designed to project fan-circulated air downward along the floor and is available in 2,000- and 3,000-watt capacity. A special plug-in arrangement to handle the current is required.

Get Closest Line Voltage

WITH A-C 5/8% STEP REGULATORS



1. On input side of regulator, fluctuating line voltage is fed into "Feather-Touch" control relay.

2. "Feather-Touch" relay accurately follows all line voltage fluctuations. Low energy in circuit eliminates need for holding coils — so there's no damping effect on sensitive floating beam.

3. Relay feeds fluctuations into "voltage integrator," which averages them up, comparing length of time that voltage is correct with time that it is outside band setting.

4. If average voltage is either too high or too low, voltage integrator operates tap-changing motor, returning voltage to normal.

HOW ALLIS-CHALMERS VOLTAGE CONTROL OPERATES

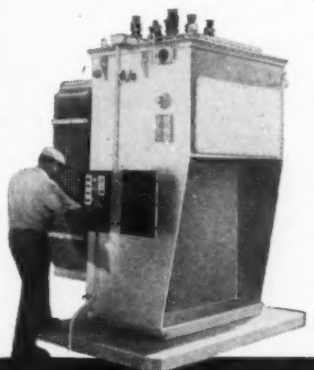
YOU CAN HAVE the best in feeder voltage regulation, on the average feeder line, with Allis-Chalmers' 5/8% Step Regulators.

Voltage is easily held within a total band width of plus-minus 5/8%, or 3/4 volt, by "Feather-Touch" control relay. Since holding coils are unnecessary, there's no damping effect to prevent relay from following closely each voltage fluctuation which occurs on the line.

These fluctuations are fed into the voltage integrator, which averages them up. If *average* voltage on line is either too high or too low, the integrating device allows regulator to make necessary correction — thus maintaining voltage at desired level.

A-C 5/8% Step Regulators regulate all feeder voltages. See our nearby sales office for more facts, or write to ALLIS-CHALMERS, MILWAUKEE, WIS.

A 2058



ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment
★ Biggest of All in Range of Industrial Products ★

5/8% STEP REGULATORS

WHY BUY
SO MANY
CARBON
BRUSH ITEMS?
STEEL COMPANY CUTS BRUSH ITEMS FROM 3370 TO 495
Makes big saving, weeding out unnecessary brush items and inventories

CHECK the number of motor and generator brush sizes and types your company orders and stocks. The number will surprise you. Even more startling, if you investigate further, is that a great part of this inventory is really unnecessary!

National Carbon Company, Inc., has launched a program of simplification and standardization to the greatest possible degree of carbon, graphite, and metal-graphite brush specifications. Eventually, the result of such effort will be the stocking of brushes of standardized types and grades.

It's a certainty that you can save money for your company by reducing the variations in brush specifications and by streamlining your brush orders and inventories. National Carbon Co., Inc., is ready to assist you in taking advantage of this program. Simply get in touch with our nearest Division Office today. Dept. EW.

HOW BRUSH SIMPLIFICATION PAYS:

1. Price advantage through quantity discounts.
2. Reduction of small orders—saving time in bookkeeping, billing, and accounting.
3. Less money and space tied up in brush stocks.
4. Less time needed to handle stock.

The word "National" is a registered trade-mark of

NATIONAL CARBON COMPANY, INC.

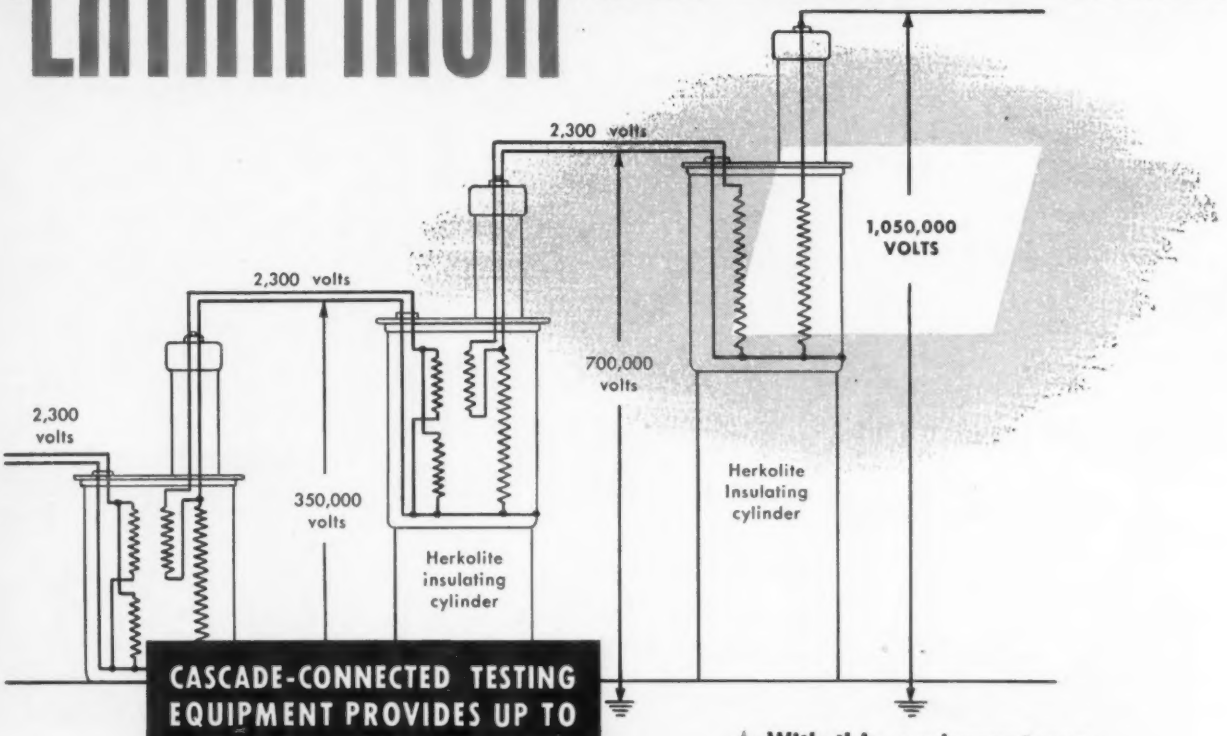
Unit of Union Carbide and Carbon Corporation

UCC

30 EAST 42nd STREET, NEW YORK 17, N. Y.

Division Sales Offices: Atlanta, Chicago, Dallas, Kansas City, New York, Pittsburgh, San Francisco

FOR EXTRA HIGH HIGH-POTENTIAL TESTS!



CASCADE-CONNECTED TESTING EQUIPMENT PROVIDES UP TO A MILLION VOLTS, OR MORE BY ECONOMICAL STEP-BY-STEP METHOD

★ **With this equipment you may have test voltages of one million or more volts**

EXTRA economy is one of the big benefits of the cascade method of obtaining extra high potentials for testing cables, ceramic and plastic insulations, and other high-voltage devices. The reasons: (1) Standard testing transformers and other auxiliary equipment are used to obtain the high voltages. (2) Step-by-step additions can be made to increase voltages even higher as the need arises. (3) The transformers may be connected in multiple for increased current output at lower voltages.

Cascade-connected equipment can be arranged for either intermittent, sustained, or even continuous voltage requirements. The addition of another testing transformer and *Herkolite insulating cylinder produces substantial increase in voltage.

EQUIPMENT INCLUDES

A typical installation includes separate testing transformers of the number required, motor-operated induction voltage regulator and control table, and circuit breaker with overload trip coils, control switches and indicating lights. For details on cascade arrangements for high-voltage testing equipments as they apply to your specific circumstances, write giving information on your requirements to *General Electric Company, 16-215, Pittsfield, Mass.* For free bulletin describing cascade and general-purpose test sets, fill in the coupon.

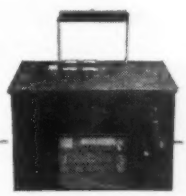
*Reg. U. S. Pat. Off.

GENERAL ELECTRIC

401-36-5155

Testing transformers, of the number required, in cascade arrangement provide potentials up to 1,050,000, at 1000 kva.

Motor-operated induction voltage regulator assures prompt control for correct test voltages.



Control table includes indicating meters for voltage and current, electric timing clock, switches, circuit breakers and indicating lights.

General Electric Company,
Apparatus Department, Sec. 401-36,
Schenectady 5, New York

Gentlemen: Kindly send me your free bulletin, GEA-4559, on Stationary A-C Testing Equipment arranged in cascade for high-potential testing.

Name.....

Organization.....

Address.....

City..... State.....

5155

...GOES TO OVER SIX MILLION PROSPECTIVE HOME BUILDERS

The advantages of modern electrical heating are being brought home to this great market in regular Electromode advertising backed up by the kind of sales promotion that gets results.

You will want to get your share of the new sales and extra profits existing in the wide-open electrical home-heating field. Electromode, a name known throughout industry for safe, reliable Unit Heaters, is out in front with a full line of attractive Bilt-in-Wall Down-Flo Heaters for the home, in all required capacities. These Heaters have the same patented, safety, finned aluminum heating element as used on Electromodes for U. S. Submarines.

Be ready to sell complete *electric* home-heating to the prospects in your territory. Get in touch with your Electrical Wholesaler for necessary details or write ELECTROMODE CORPORATION, Rochester 3, N. Y.

Approved by Underwriters' Laboratories

ELECTROMODE
All-Electric Bilt-In
ROOM HEATERS

Send for illustrated Booklet 46-D on Electromode Electrical Heating for Home, Office, and Factory.

WEST COAST FACTORY REPRESENTATIVES—RUSSELL AND COMPANY, 1355 Market Street, San Francisco 3, Calif.; HARRY F. HALDEMAN, INC., 1106 South Hope Street, Los Angeles 15, Calif.; FRED W. CARLSON, 307 Wall Street, Seattle 1, Wash.; JOHN W. LADLOW, P.O. Box 1784, Phoenix, Ariz.

Radio-Phonograph (908)

G-E is producing a re-engineered line of Musaphonic radio-phonograph combinations, including four basic models to be manufactured in eight cabinet styles. These instruments have 16 tubes including rectifier and tuning indicator, the standard broadcast tuning band and three short-wave spread bands. They are designed for both high- and low-band FM reception. The audio system powers two 10-in. permanent magnet Alnico 5 loudspeakers; the amplifier has a response to about 20,000 cycles. These sets have the new G-E tuning system, tone arm and electronic reproducer.

Portable Radio (909)

Feature of 1947 Remler Scottie is an "invisible" carrying handle which drops down out of sight when not in use. The model has 5 tubes including rectifier, is completely enclosed and has a fused safety plug. The case is plastic, the dial is of transparent lucite, with numerals and colored markings molded in.

Table Models (910)

Lear is in production with three table-model 5-tube radio sets. Model 561 is in a mahogany case, with slide rule dial; Model 563 is in an ivory plastic case, Model 562 in a mahogany plastic case.

Appliance Switch (911)

A heavy-duty, double-pole, single-throw appliance switch is offered by the Trilmont Products Co. It will operate on devices rated up to 2,500 watts a-c or d-c, 125 or 250 volts, and carries the UL listing of 20 amp. at 125 volts. A neon glow light, visible from three directions, indicates when current is on.

Immersion Heater (912)

An electric heater claimed to heat a wash bowl of water to the boiling point in five minutes is offered by the Elden Products Co. It is 5½x2 in., weighs 1 lb., operates by placing in water. Comes equipped with a 6-ft. waterproof rubber cord.

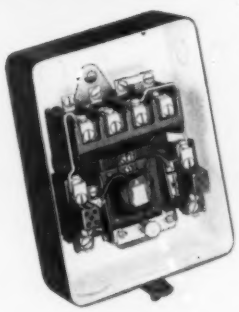
Interference Filter (913)

A filter claimed to eliminate radio interference from fluorescent lamps and many types of electrically operated appliances and machines, is being offered by Cornell-Dubilier. This IF-54 interference filter is rated at 2 amp., 120-200 volts a-c.

Washer (914)

Norge's postwar deluxe washer, Model W-18, features 2½-in. cushion rolls and self-reversing flume on the damp dryer; quick emptying drain; large casters; an eight-position wringer that will not wring while swinging.

From any angle...



you can SEE THE QUALITY of A-B Starters

Examine an Allen-Bradley Bulletin 709 solenoid starter. Notice the solid ruggedness of its parts . . . the careful assembly . . . the finished appearance . . . the finish of the entire starter. Every detail reveals the care that has gone into its design and construction. And notice, too, the simple solenoid mechanism . . . the absence of trouble-making pivots, pins, and bearings . . . the smooth action of the solenoid plunger . . . the precision seal between the pole faces of the solenoid plunger and the magnet. It is this multitude of little things —small in themselves—that add up to what can best be expressed as Allen-Bradley QUALITY.

A-B Quality

ALLEN-BRADLEY

SOLENOID MOTOR CONTROL

QUALITY

Good for MILLIONS of Operations

Bulletin 700 (A.C.) ★ Bulletin 200 (D.C.)
SOLENOID RELAYS

Here is a line of small, solenoid-operated relays for industrial applications that require unfailing dependability. Can be furnished in single and multiple pole construction, up to and including 12-pole units. Available in the open type, or in the NEMA Type 1, Type 4, and Type 7 enclosures.

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.

NO BEARINGS, PINS, PIVOTS
The only moving part is the solenoid plunger. There are no parts to gum up or corrode and cause trouble.

NO CONTACT MAINTENANCE
Double break, patented cadmium silver alloy contacts never require any cleaning, filing, or dressing.

SIMPLE, RUGGED DESIGN
Bulletin 700 relays are ruggedly built to withstand millions of operations on the heaviest industrial service.

EASY TO WIRE
All terminals are conveniently accessible and plainly marked. Enclosures provide generous space for wiring.

A-B Quality

ALLEN-BRADLEY
SOLENOID MOTOR CONTROL
QUALITY

Also . . .
BULLETIN 709
Across-the-Line
SOLENOID
STARTERS

Now six sizes, all designed to meet every industrial service. Maximum rating: 100 hp, 220v; 200 hp, 440-550-600 v.

...more than just a NEW package

The new Cooper package protects the product, insures its safe delivery, and permits quick identification of what's inside. A glance at your stock shelf tells you instantly all essential information — what bolt, screw, nut or washer the box contains, what size, what head, what thread.

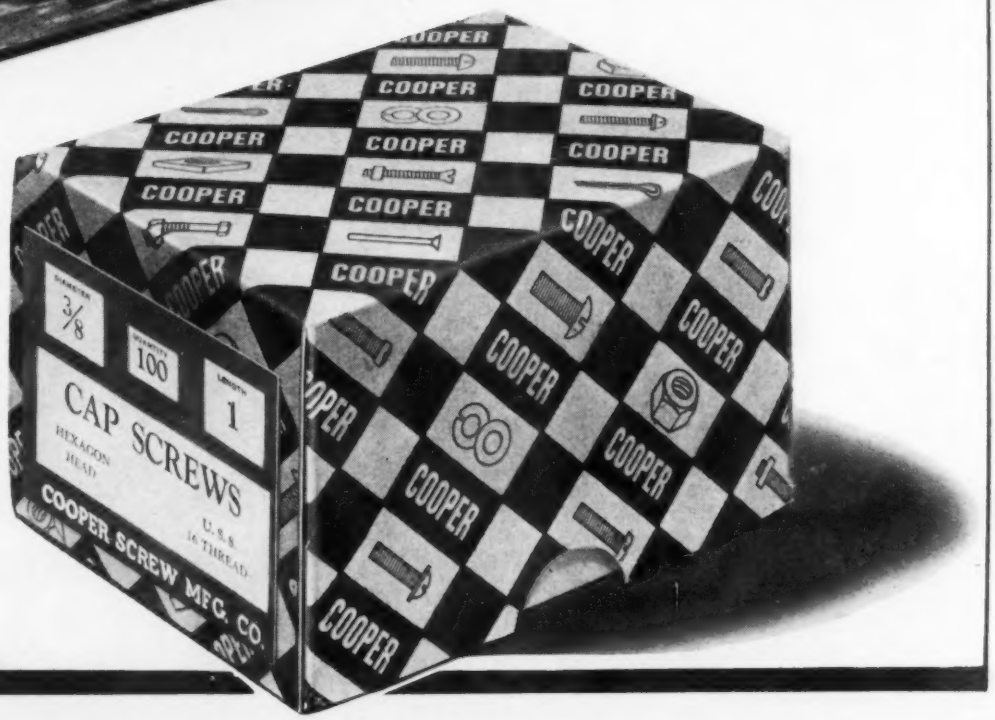
But it doesn't tell you the significant facts about Cooper products . . . the use of better steels, the close attention to uniformity, nor the 15 years of progressively better productive methods of the Cooper plant — the largest most completely integrated plant this side of Chicago making fasteners by the upset process.

Nor can you know the large warehousing of stock items in package or bulk for quick delivery at low competitive prices, or the modern engineering facilities for producing "specials," unless you investigate. So, if you're looking for fasteners better than what you are getting, call your Cooper jobber today.

COOPER

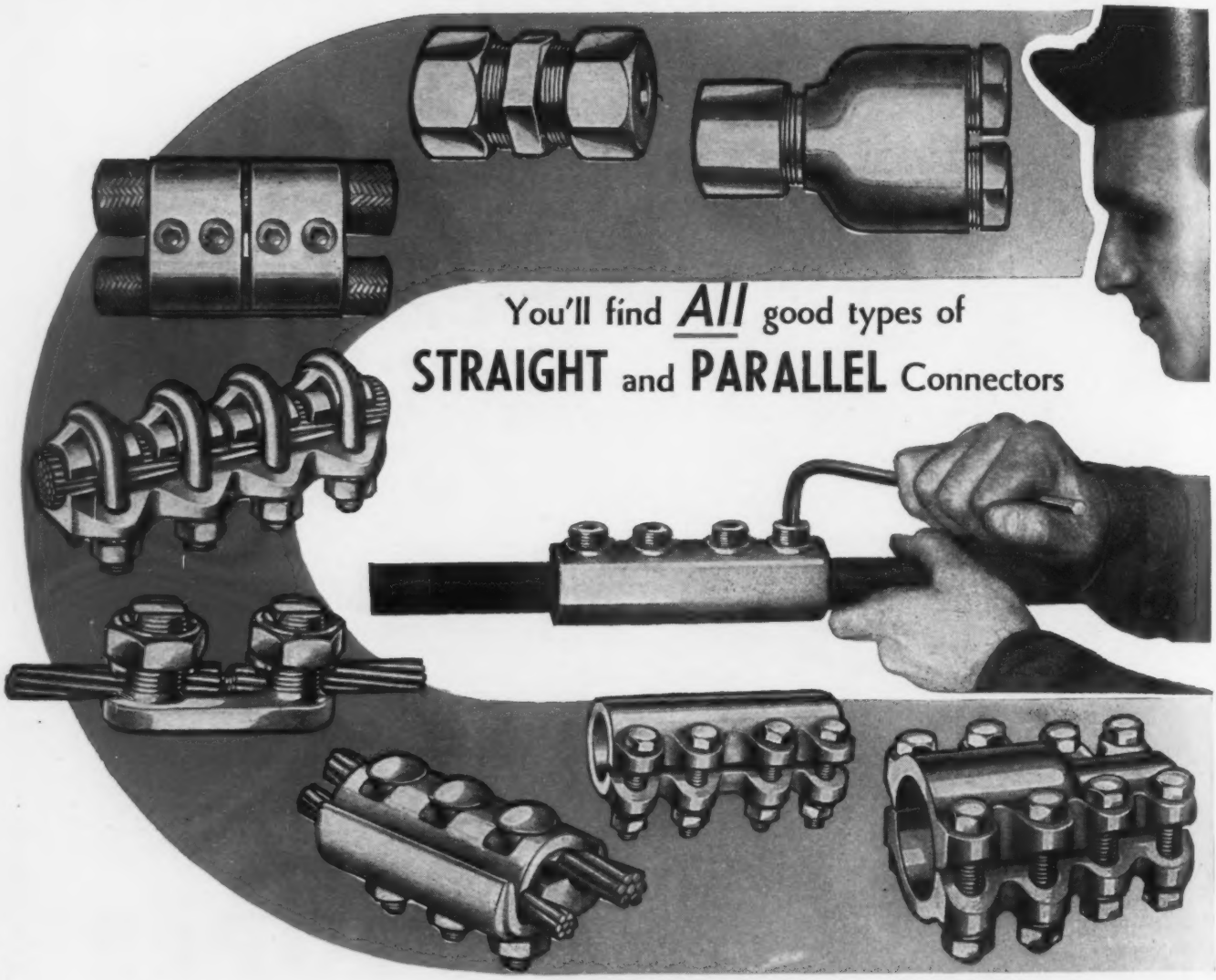
Screw Manufacturing Company

4466 WORTH STREET, LOS ANGELES, CALIF.



Branch Office:
529 Central Bank Bldg.
Oakland, Calif.

Representatives:
L. M. Baxter Co.
1006 Lowman Bldg.
Seattle, Wash.
L. M. Baxter Co.
1238 N.W. Glisan St.
Portland, Oregon
California Sales Agcy.
666 State Street
San Diego, Calif.
Robert L. Knowles Co.
613 2nd Nat'l Bk. Bldg.
Houston, Texas



in the *Complete* line

Yes, it's mighty handy to open your Penn-Union Catalog and pick the exact type you need. They're all there—in a complete range of sizes: Bolted straight connectors . . . screw type . . . various split sleeve types . . . shrink fit . . . universal clamps . . . E-Z connectors with yoke and nut, etc.

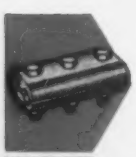
The Penn-Union Catalog also gives you the *complete* line of Service Connectors, Tees, Cable Taps, Grounding Connectors, Lugs, Power Connectors, etc.

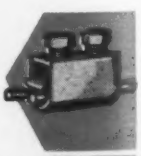
Preferred by leading users — who have found that *"Penn-Union" on a fitting is their best guarantee of unfailing service.*

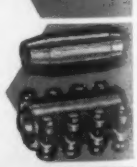
Kenneth Anderson Co.
334 East 4th St.
Los Angeles

Northwestern Agencies
2411 First Ave.
Seattle, Washington

F. M. Nicholas Co.
1123 Harrison St.
San Francisco







PENN-UNION ELECTRIC CORPORATION, ERIE, PA.

THE *Complete* LINE OF CONDUCTOR FITTINGS

PENN-UNION

YOU'RE ON THE RIGHT TRACK...

WITH U.S. SECURITY

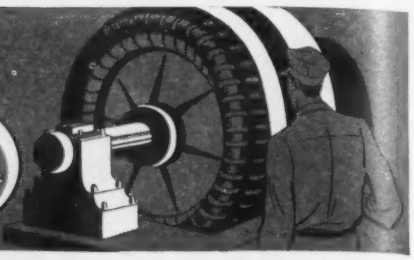
● **Why? Because Security does the job better. It's highly dielectric, non-ravelling, straight-tearing, highly insulating and has strong adhesion.**

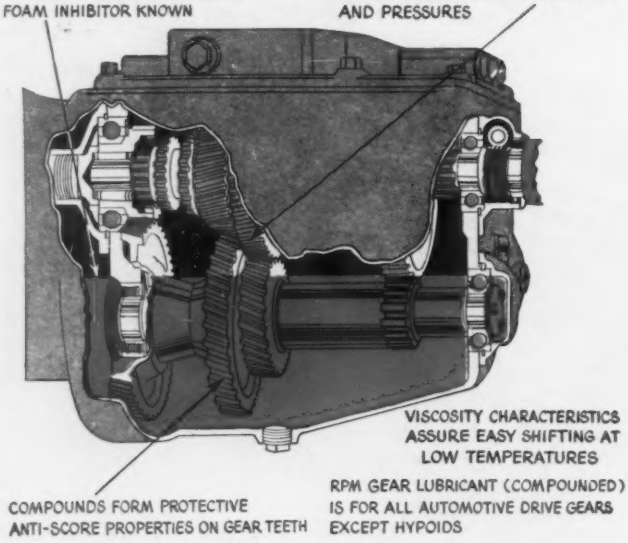
Serving Through Science

UNITED STATES RUBBER COMPANY

1230 AVENUE OF THE AMERICAS • ROCKEFELLER CENTER • NEW YORK 20, NEW YORK

STANDARD ENGINEERS NOTEBOOK




RPM GEAR LUBRICANT (COMPOUNDED) CONTAINS THE MOST EFFECTIVE FOAM INHIBITOR KNOWN
RPM GEAR LUBRICANT (COMPOUNDED) RESISTS HIGH GEAR TEMPERATURES AND PRESSURES
VISCOSITY CHARACTERISTICS ASSURE EASY SHIFTING AT LOW TEMPERATURES
COMPOUNDS FORM PROTECTIVE ANTI-SCORE PROPERTIES ON GEAR TEETH
RPM GEAR LUBRICANT (COMPOUNDED) IS FOR ALL AUTOMOTIVE DRIVE GEARS EXCEPT HYPOIDS

Compounded lubricant prevents gear scoring

Many operators of automotive equipment have eliminated transmission and differential trouble by switching to RPM Gear Lubricant (Compounded). It is recommended for all transmissions and all conventional differentials. (RPM Hypoid Lubricant should be used in hypoid differentials.)

The compounds in RPM Gear Lubricant assure that a tough, oily film will remain on gears when pressure and heat become excessive. A highly effective foam inhibitor prevents retention of air in lubricant, poor distribution and "boiling up" to cause leaks.

RPM Gear Lubricant (Compounded) is non-corrosive. It comes in four grades: SAE 80, 90, 140, 250.

For complete information about automotive drive gears and their lubricants, write for the new, free booklet: "The Lubrication of Automotive Gears."

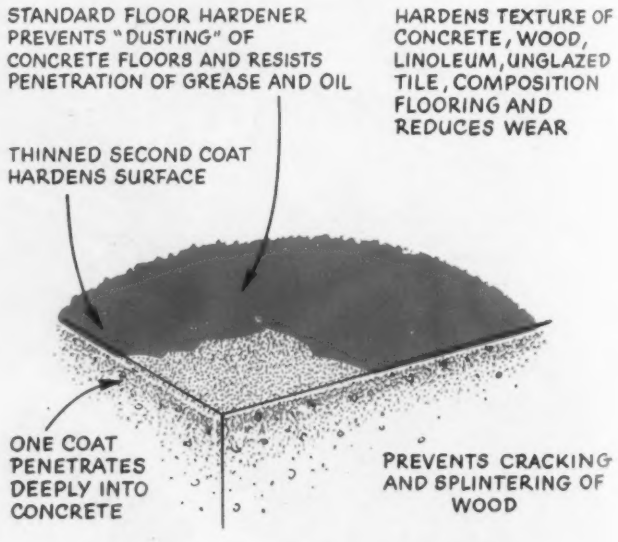
Floor Hardener stops concrete "dusting"

Extra wear and the cost of maintaining and cleaning concrete floors can be reduced by treating them with Standard Floor Hardener.

Containing many of the materials that go into fine varnishes, Standard Floor Hardener penetrates and seals the pores of concrete, wood, linoleum, composition flooring and unglazed tile. It provides a smooth, hard surface that is easier to keep clean. It binds the surface of concrete so that decomposition called "dusting" is retarded.

Because of the porosity of concrete, two coats of Standard Floor Hardener should be used on such floors. The first will penetrate deeply. When it has dried, it will keep the second application near the top and form a non-slippery, wear-resistant surface. Always thin the second coat by adding 25% Standard Compounded Paint Thinner.

Care should be taken to have concrete, and other surfaces thoroughly dry before treating.

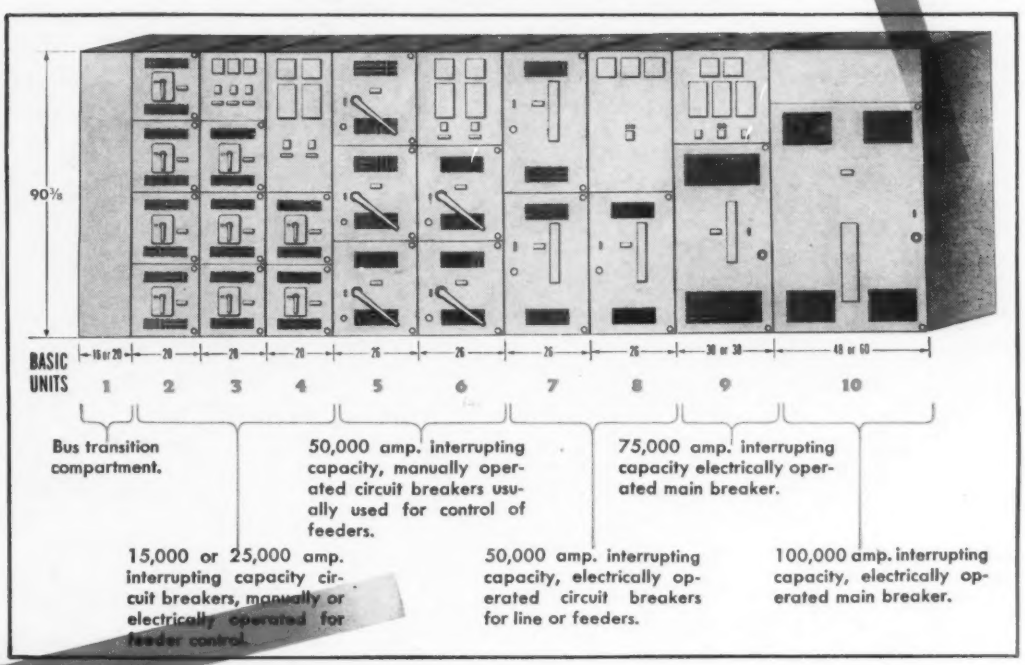

STANDARD FLOOR HARDENER PREVENTS "DUSTING" OF CONCRETE FLOORS AND RESISTS PENETRATION OF GREASE AND OIL
HARDENS TEXTURE OF CONCRETE, WOOD, LINOLEUM, UNGLAZED TILE, COMPOSITION FLOORING AND REDUCES WEAR
THINNED SECOND COAT HARDENS SURFACE
ONE COAT PENETRATES DEEPLY INTO CONCRETE
PREVENTS CRACKING AND SPLINTERING OF WOOD

CROSS SECTION OF CONCRETE FLOOR

Standard Fuel and Lubricant Engineers are always at your service. They'll gladly give you expert service—make your maintenance job easier. Call your local Standard Representative or write Standard of California, 225 Bush St., San Francisco 20, California

FOR EVERY NEED A STANDARD OF CALIFORNIA JOB-PROVED PRODUCT

Meets— every 600-Volt Switchgear Requirement with 10 Basic Units


90⅜
BASIC UNITS
1
2
3
4
5
6
7
8
9
10
Bus transition compartment.
50,000 amp. interrupting capacity, manually operated circuit breakers usually used for control of feeders.
75,000 amp. interrupting capacity electrically operated main breaker.
15,000 or 25,000 amp. interrupting capacity circuit breakers, manually or electrically operated for feeder control.
50,000 amp. interrupting capacity, electrically operated circuit breakers for line or feeders.
100,000 amp. interrupting capacity, electrically operated main breaker.

"Unitized" switchgear eliminates special design and engineering costs, yet gives "custom-built" performance because it meets specific application requirements. Selection of the right combination is made from only 10 basic units for service up to 600 volts . . . 25 to 6000 amperes . . . and 15,000 to 100,000-ampere interrupting capacity.

Westinghouse "Unitized" Switchgear is assembled, wired and tested before delivery, and shipped as a single unit. It's ready for service as soon as main cable and control connections are made.

Air circuit breakers are the removable, drawout type for easy maintenance and inspection. They are enclosed in separate compartments, with doors which are interlocked to prevent opening while breaker is closed. Interlocks and positioning devices assure safe removal or replacement of breakers.

The welded, completely bonderized structure is built of stretcher-leveled sheet metal. All hinges are concealed; instruments, relays and watt-hour meters are semiflush mounted. Flexitest cases for relays and watt-hour meters eliminate separate test switches.

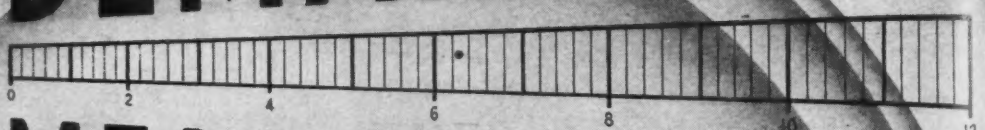
For complete information, write for Booklet B-2296-B. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-60640

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

"UNITIZED" SWITCHGEAR

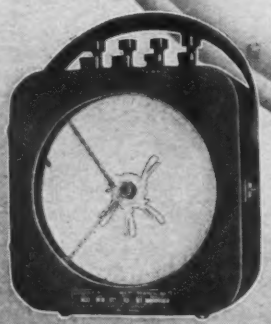
DEMAND MEASUREMENT



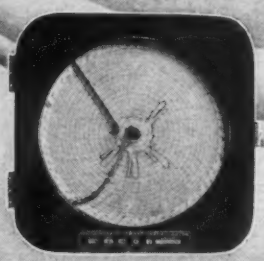
GIVES FACTS FOR DESIGNING RATES

SANGAMO DEMAND INSTRUMENTS

TO BE SOUND, rates must compensate for all costs, should develop profitable markets, should not be discriminatory, and should be applicable to loads widely varying in character. Best rate design is based on facts. Only measured facts are known facts. Sangamo Lincoln-Type Graphic Demand Meters provide accurate information as to the magnitude of demands, the time at which the demands occur, and their duration. Other Sangamo Demand Instruments are available in an extensive line—designed for your particular needs.



TYPE CCW
(Portable)



TYPE CCW
(Switchboard)

Sangamo Lincoln-Type CCW Portable and Switchboard Graphics are, respectively, top connected for temporary or test installations, and back connected for panel mounting.

TYPE CCW
(with terminal chamber on bottom)

Sangamo Lincoln-Type CCW Graphic Demand Meter provides an accurate, reliable, and economical means wherever a record of the time and duration, as well as the magnitude, of demand is required. A wide variety of indicating instruments is also available.

SANGAMO
ELECTRIC COMPANY
SPRINGFIELD • ILLINOIS

General Electric re-opens vastly expanded Lighting Institute as keynote of "Better Lighting" drive

WITH its formal rededication on September 11, the famous General Electric Lighting Institute at Nela Park in Cleveland is ready to resume its prewar role as "Lighting Headquarters of the World at the University of Light."

This re-opening is not merely a matter of "taking up where we left off." Former visitors will find that the New Institute has taken a gigantic step ahead, with sweeping improvements in buildings, equipment, displays and demonstrations.

Training courses at the Institute use the most advanced educational techniques to speed the flow of information on lamps and lighting to consumers. New facilities have been added to make visits to the Institute more helpful to public utility representatives, lamp distributors and other groups directly concerned with lighting sales.

The New Institute—serving as the nerve-center of America's lighting education—is a part of the General Electric Lamp Department's biggest program to promote Better Lighting for every commercial, industrial and home purpose.

This program concerns you . . . because it ties in directly with your own load-building activities.

➡ *So... turn the page and see how...*

G-E Lamp Campaigns help

1

"SEEING IS THE BIGGEST THING IN SELLING"

Here's a comprehensive packaged program that will help you make the most of today's pent-up commercial lighting market. Remember... 8 out of 10 stores are prospects for modern Store Lighting. This promotion clicks, because it includes all the meeting materials, training courses, sales aids and direct mail needed to do the whole job, from educating salesmen to closing the business.

ELECTRICAL CONTRACTORS are given a feature role in this important General Electric program through a series of four special district meetings, which present the facts, figures, ideas and selling tools they need to develop more Store Lighting business.

2

COMPLETE LIGHTING SALES TRAINING

Developed in cooperation with the LaSalle Extension University, this unique General Electric program is designed to help you build the effectiveness of your sales force in selling Store Lighting, Industrial Lighting, Office and School Lighting and Home Lighting. Each course includes complete textbooks which explain the most successful methods for developing and closing lighting sales in the particular field covered.

3

"STAY BRIGHTER LONGER!"

This isn't just a slogan—it's the guiding principle behind all G-E Lamp Research—to give the consumer more and more light for his money. "Stay Brighter Longer!" runs through all General Electric lighting promotion, but it is given full-page, four-color prominence in a lively series of national advertisements designed to catch the eye of everyone who buys household lamps. These appealing messages build G-E lamp bulb sales—and your lighting load!

and

you sell Better Lighting!

4

BULBSNATCHERS . . . CAUGHT IN THE ACT!

Those empty light sockets—millions of 'em—still constitute one of the biggest challenges in the promotion of Better Lighting. By dramatizing the potential consequences of bulbsnatching—inconvenience, eyestrain and accidents—G-E gives consumers a powerful incentive to keep sockets filled with right-size bulbs. And this fall G-E Lamps is adding new popular appeal to this campaign by presenting leading comic stars of radio and screen in a series of hilarious bulbsnatching situations on the pages of Life, Saturday Evening Post, Collier's, Look and Liberty.

5

POINT-OF-SALE PROMOTION

The real follow-through of General Electric's campaign to fill empty light sockets takes place right at the dealer's counter, where full-color bulbsnatching displays tie in directly with national advertising to remind customers that *now* is the time to stock up on G-E Lamps. This is typical of all G-E Lamp campaigns. Effective dealer tie-in materials are always provided to give impact at the point-of-sale.

6

"YOUR PLACE IN THE SUN"

Later this fall G-E Lamps will launch its most aggressive home-lighting campaign in years—another step in the long-range program that made such important headway with "Better Light — Better Sight." "Your Place in the Sun" is a comprehensive promotion which ignores none of the possibilities of today's home lamp market. Besides lamps for illumination, it includes other load-builders such as infra-red, germicidal and sun lamps. "Your Place in the Sun" will be ready to go in November, with plenty of motion pictures, slide films, sales training courses, new literature and other sales aids to make it a "must" in your home-lighting promotion schedule.

behind all these promotions is . . .

G·E's Complete Line of Lamps

GENERAL SERVICE
3-LITE
GERMICIDAL
INFRA-RED
SUN LAMPS
SLIMLINE
CIRCLINE
REFLECTOR
FLUORESCENT
SILVERED BOWL
STREET LAMPS
NIGHT LAMPS
MOVIE PROJECTION
MERCURY
PROJECTOR
MINIATURES
SPECIALTIES

NO LIGHTING JOB CAN BE BETTER THAN ITS LAMPS— and it's the continuing aim of G-E Research to lead the way with an ever-increasing line of high quality lamps for all purposes... lamps made to *Stay Brighter Longer.*

***COMPLETE SPECIFICATION DATA AND HELPFUL LIGHTING IDEAS** are available on every line of G-E Lamps for every major field of application. Call your General Electric Lamp Representative and tell him what kind of information you need—he'll get it for you.

G·E LAMPS

Constantly improved by research to

Stay Brighter Longer!

GENERAL ELECTRIC

NOW YOU CAN "Hang the Sky" TO HELP THEM SEE BETTER

Over-ALL Lighting

by Wakefield

Let the STAR provide a sky of easy-eye light

Here's the answer for many of your customers. Provides all the advantages of both fluorescent and indirect light *plus simple, sturdy construction and easy maintenance.* Checked and improved by pre-testing. Unusually simple to handle and clean—Plaskon reflector section slides out like a drawer. No need to take unit apart. Ideal for office, drafting room or school. Ask for details.

It's new — THE WAKEFIELD STAR

Helps you build commercial LIGHTING LOAD

Over-ALL Lighting by Wakefield provides a new method for lighting office interiors, drafting rooms and schools. A method that makes for easier seeing *and for more business for you!*

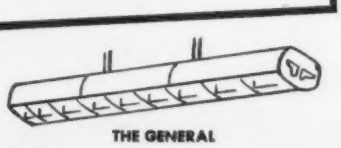
Designed to protect eyes against strain, the new Wakefield Over-ALL Lighting method spreads soft pleasing light *over all.* Your customers will like it because this new system is based on lighting results which mean comfort plus efficiency.

And especially important to you—Wakefield equipment for Over-ALL lighting has been designed to simplify your job . . . since easy installation, easy maintenance and long-lasting service *in addition to top lighting performance* makes selling easier.

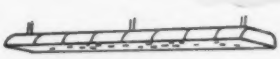
Ask your Wakefield representative to tell you how Over-ALL Lighting can work for you. The F. W. Wakefield Brass Company, Vermilion, Ohio.

Wakefield

LIGHTING EQUIPMENT FOR OFFICE, SCHOOL AND DRAFTING ROOM



THE GENERAL

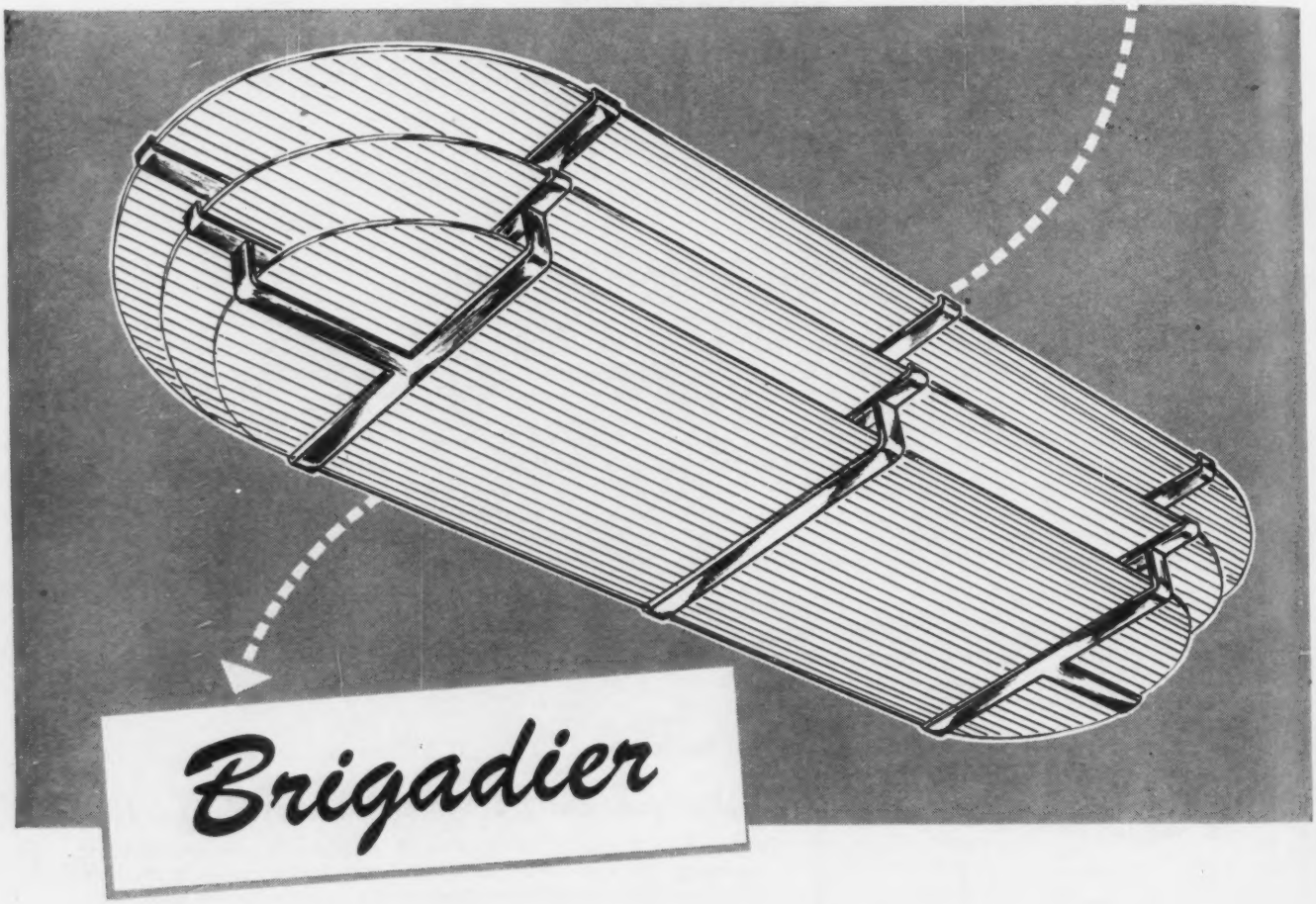


THE GRENADIER

THE COMMODORE

THE DIPLOMAT

California Scores Again with the *All-Brite*



The new *All-Brite Brigadier* the latest creation of our expert designers—adds a distinctive modern touch to any lighting scheme. This fixture combines attractive design with the highest degree of lighting efficiency. Available for 4-40 watt and 6-40 watt, or 4-20 watt and 6-20 watt tubes.

SOLD THROUGH RECOGNIZED JOBBERS ONLY

Approved by Underwriters' Laboratories • Union Made

WRITE FOR CATALOG AND DISCOUNT SHEET

Manufactured by

FLUORESCENT FIXTURES OF CALIFORNIA

819 ELLIS STREET
SAN FRANCISCO 9, CALIF.

All-Brite
TESTED AND APPROVED

Manufacturers of
"ALL-BRITE" Fixtures

Benjamin's 45th Anniversary Brings You Further Assurance

A New Benjamin Product Development and Testing Laboratory

is dedicated to the advancement of the art and science of illumination so that you may have ever greater assurance that YOU LIGHT RIGHT, WHEN YOU LIGHT WITH BENJAMIN.

Forty-five years ago, Benjamin began with a pioneering idea that had for its objective a better utilization of the electric lamp.

That idea, the Benjamin wireless cluster, was good enough to revolutionize the then infant lighting industry . . . good enough still to have practical application in World War II.

Today, on the occasion of our 45th anniversary, we dedicate another in the long line of pioneering steps . . . a new Product Development and Testing Laboratory.

Its purpose is to further advance the assurance that "you light right when you light with Benjamin". Through the years, painstaking engineering, and insistence on quality have assured users that they *light right* with Benjamin . . . light right from a standpoint of *light output efficiency* . . . light right from the standpoint of *correctly designed units* for the seeing task . . . light right from the standpoint of *minimization of glare* . . . light right from the standpoint of *durability*, *dependability* and *minimum maintenance cost.*

Through unyielding insistence on highest mechanical standards Benjamin units have become known as "the lighting equipment that's built like a battleship". It shall be the purpose of this new Laboratory to maintain and enhance this reputation . . . to raise quality standards . . . to give the purchaser greater value . . . in a word, to give ever increasing assurance that "*You Light Right when you Light with Benjamin.*" Benjamin Electric Mfg. Co., Dept. J, Des Plaines, Illinois.

BENJAMIN TRADE MARK

Lighting Equipment

Distributed Exclusively through Electrical Wholesalers

1904

Copyright 1946 by Benjamin Electric Mfg. Co.

45th ANNIVERSARY YEAR

Railley DOES IT AGAIN

PIN-IT-UP* LAMPS

With PLUS features for Better Lighting ... Greater Sales!

Amazing new features in Pin-It-Up Lamps will make these popular lamps even better sellers than even before. Again, you can look to Railley for leadership.

*Reg. U. S. Pat. Off.

NO-GLARE LIGHT SAVER

This ingenious shield fits over reflector bowl, protecting eyes from upward glare, so lamp can be mounted at correct height, 55" from floor to top of shade. This shield also casts more light downward, gives 50 footcandles of light when mounted at the correct height . . . an increase of 72% with same bulb.

New

PLASTISILK SHADES

Amazing new material that looks like a fine silk shade, but without unsightly frame shadows. Washes like a china dish, durable for lasting loveliness. (*See illustration above*)

LUMINOUS GLO-SWITCH ON PLASTI-SOCKET

Glows in the dark

With fluorescent material moulded right into the plastic, the switch is easy to find in the dark without fumbling. Made in Turn-Knob style on some models, and in Push-Button style on others.

AND AGAIN..AND AGAIN!

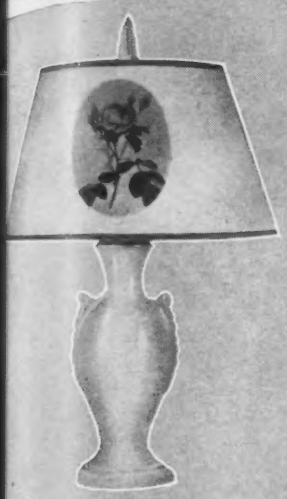


TABLE LAMPS

for new, improved wide-angle lighting

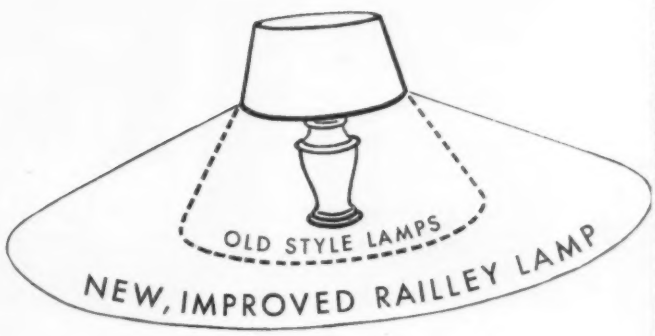
When Railley entered the table lamp field, you could naturally expect something *special* . . . and here it is! Revolutionary new developments that not only give you handsome lamps . . . but better lighting performance.

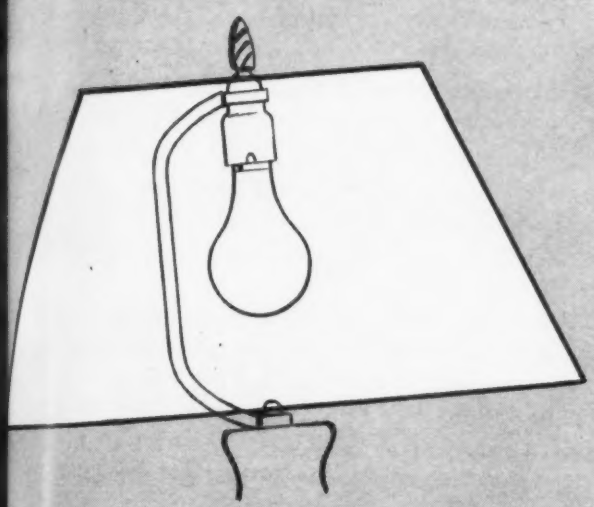
NEW DEEP-SET SOCKET

Increases light spread 159%

. . . . light intensity 66⅔%

The new PLASTI-SOCKET is set deep into the vase lowering the light source about two inches, with the socket completely invisible. It spreads light over a far wider radius, increases the light area 159%. At 20" from base (average reading distance) it gives 66⅔% greater intensity of soft, glareless light than heretofore.





INVERTED PLASTI-SOCKET

increases light 52%

Featuring the new GLO-SWITCH FINIAL

Here the socket is simply inverted, suspended from an attractive ivory-finished arm, with the bulb downward. GLO-SWITCH on socket forms a creamy flame-shaped finial, easy to see and reach in the dark.

Railley

CORPORATION · CLEVELAND, OHIO

ORIGINATORS OF THE

PIN·IT·UP LAMP·

*Reg. U. S. Pat. Off.

How RLM Standards Institute Helps BUYERS and SPECIFIERS

Measure Values

IN INDUSTRIAL LIGHTING EQUIPMENT

SPECIFICATIONS . . . . . The procedure for developing an RLM Standard Specification requires a thorough investigation and report by a Technical Committee of the Institute, guided by the findings of the Illuminating Engineering Society and other recognized industry associations. These specifications are available without charge to everyone interested.

INSPECTION . . . . . A rigid inspection and testing system, conducted by Electrical Testing Laboratories, Inc. a wholly independent testing organization . . . provides positive assurance that RLM certified Industrial Lighting Units conform to RLM rigid standards of efficiency and economy.

CERTIFICATION . . . . . When equipment so inspected and tested conforms to RLM specifications, the laboratory issues a label of compliance. When you find this RLM LABEL affixed to an industrial lighting unit you know that it has been manufactured in compliance with the exacting procedure developed and administered by RLM Standards Institute.

The RLM Standards Institute is a non-profit organization. Any manufacturer of Industrial lighting equipment may at his own initiative, if he so desires, submit his equipment for RLM inspection and certification. He need not become a member of the Institute. It is only necessary for him to assume his equitable share of the cost of operating the program.

The lettters RLM Stand for Reflector and Lighting Equipment Manufacturers

RLM STANDARDS INSTITUTE
INCORPORATED

307 N. MICHIGAN AVE. SUITE 420 • CHICAGO 1, ILLINOIS

SYLVANIA NEWS
CENTRAL STATION EDITION

SEPT. *Prepared by* SYLVANIA ELECTRIC PRODUCTS INC., Salem, Mass. 1946

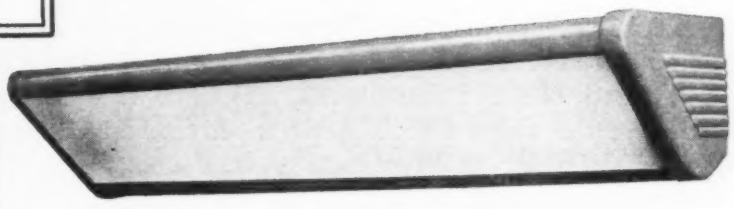
NOW! TWO NEW FLUORESCENT LAMPS IDEAL FOR EVERY ROOM OF THE HOME!

RW-160

A specially-designed fluorescent pin-up lamp to be placed wherever an extra unit of light is needed! Here's Sylvania's answer to the ever-increasing demand for fluorescent illumination that can be "just plugged in."

RW-160—beautiful little unit about 10" high, made to blend with any environment, attractively shielded by curved glass diffusing panel. Can be used as all-night lamp in baby's room! Old ivory or light bronze baked finish. (Extension cord model, RW-160C.)

RW-220—streamlined, available in white baked finish; carries two 20-watt lamps shielded by diffusing panel of ribbed, frosted glass. Made to supplement existing lighting . . . can be plugged in anywhere! (RW-220C.)



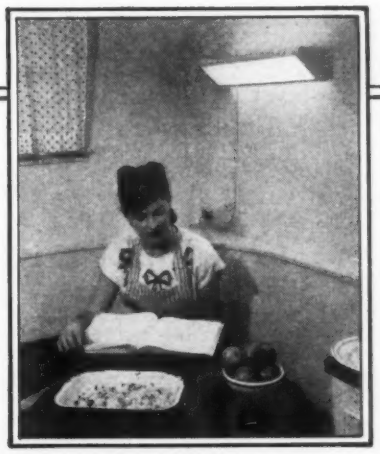
RW-220

ABOVE—*Light-weight RW-160. Complete package of light—ready to install—with built-in ballast and starters. Ideal for hallways, closets. Made with or without extension cord.*

RIGHT—*Compact RW-220. Great variety of uses: reading-lamp over bed; wall light in kitchen, playroom—wherever direct or indirect lighting is desired. Has built-in ballast and starters. Made with or without extension cord.*

RW-160C serves anywhere—gives a touch of light just where needed. Used above as pin-up bedroom lamp. A convenient, casual lamp.

THE RW-160C
and
THE RW-220C
IN ACTION!



RW-220C used above for special kitchen purpose. Provides direct as well as indirect lighting.

SYLVANIA ELECTRIC

MAKERS OF FLUORESCENT LAMPS, FIXTURES, WIRING DEVICES; ELECTRIC LIGHT BULBS; RADIO TUBES; CATHODE RAY TUBES; ELECTRONIC DEVICES

"Certified"

ON A BALLAST COVERS A LOT OF TERRITORY!

Here are a few of the more important reasons why

TO begin with, that CERTIFIED label means fluorescent lamp ballasts which have been built to rigid specifications . . . tested, checked and CERTIFIED as meeting those specifications by impartial experts—Electrical Testing Laboratories, Inc. of New York.

Specifically, the benefits to users and sellers of Certified Ballasts *cover lots of territory.* For instance: Certified Ballasts are quiet in operation. They're protected against dangerous temperature rises. Properly installed, Certified Ballasts will outlast the entire lighting installation. Rigid specifications, careful testing and latest manufacturing methods produce *uniform quality.* And Certified Ballasts *cost no more* than any other ballasts!

So why not be sure? Look for the ETL Certification mark on the equipment you specify.

Certified Ballast Manufacturers

Makers of Certified Ballasts for Fluorescent Lighting Fixtures

The Acme Electric & Mfg. Co.
Cuba, New York

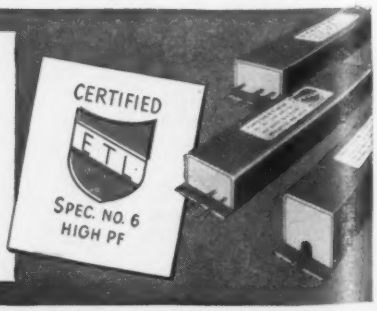
Chicago Transformer Div.
Essex Wire Corporation
3501 Addison St., Chicago, Illinois

General Electric Co.
Specialty Transformer Division
Fort Wayne, Ind.

Jefferson Electric Co.
Bellwood, Illinois

Sola Electric Co.
2525 Clybourn Avenue
Chicago 14, Illinois

Wheeler Insulated Wire Co.
378 Washington Ave., Bridgeport, Conn.



"MITCHELL" preferred"

DISTRIBUTOR

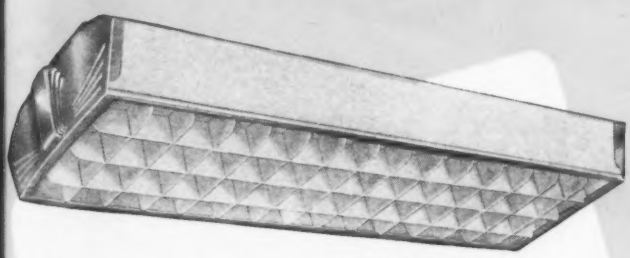
I PREFER MITCHELL Commercial Lighting because it's easier to sell. Both contractors and users recognize and *demand* MITCHELL quality and appearance. Customer satisfaction is assured, and my reputation is protected. That's why *my* Lighting Department concentrates on MITCHELL, the complete line that fills every commercial need.

CONTRACTOR

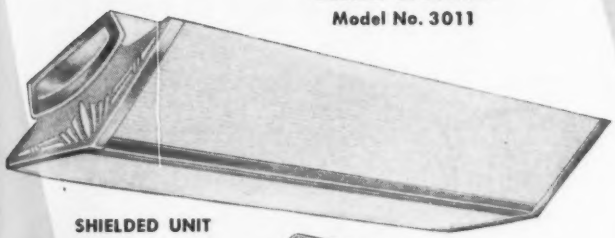
I PREFER MITCHELL Commercial Luminaires because they're easier to install and maintain—accepted absolutely by my customers as top-quality lighting units. I've had plenty of experience with commercial lighting installations, and *I'll* stay with MITCHELL, the line that builds acceptance for my skill and service.

USER

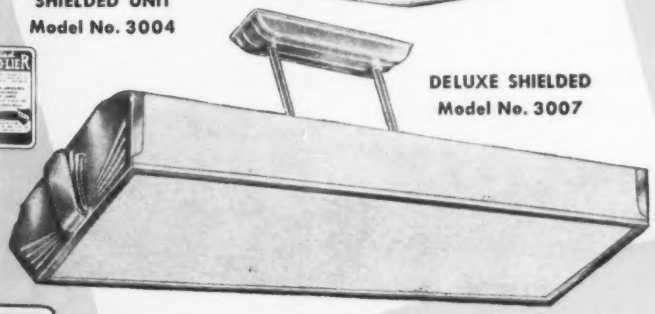
I PREFER MITCHELL Lighting because I know I'm getting carefully planned quality illumination to fit my needs. I like the combination of functional efficiency and modern beauty of design. MITCHELL Commercial Luminaires are a genuine asset to my business. *I play safe —I* buy from the house that sells MITCHELL.



DELUXE LOUVERED
Model No. 3011



SHIELDED UNIT
Model No. 3004



DELUXE SHIELDED
Model No. 3007

preferred COMMERCIAL LUMINAIRES

HIGHER LEVELS OF ILLUMINATION
MODERN BEAUTY IN EACH DESIGN
COMPLETE LINE TO FILL EVERY NEED
PREFERRED MITCHELL QUALITY, VALUE

Mitchell Manufacturing Company
2525 CLYBOURN AVENUE, CHICAGO 14, ILLINOIS
Far West: *Complete Modern Plant and Sales Office at Los Angeles*
Serves the Entire Pacific Coast Area
1019 NORTH MADISON AVENUE, LOS ANGELES 27, CALIFORNIA

"MITCHELL"

Makers of Commercial and Industrial Fluorescent Lighting Equipment
Store Window Lighting • Spotlights and Floodlights • Desk Lamps • Portable Floor and Table Lamps • Bed Lamps • Ultraviolet and Infrared Health Lamps • Residential Lighting Specialties . . . Rad-i-Air Germicidal Units (made by Tru-Air Ultraviolet Products Co., Los Angeles.)

A NEW TRAINING COURSE FOR ALL LIGHTING SALES PERSONNEL

Those who sell lighting today are the first who must be educated in today's new lighting techniques.

Changes in lighting engineering and improvement of light sources, lighting techniques, and lighting equipment have rendered obsolete much of the previous information on these subjects.

This new Westinghouse visual training course has been prepared to help electric service companies provide their lighting sales personnel with needed new information.

It is hoped that this course will help the lighting industry capitalize its greatest sales opportunity—the opportunity of demonstrating what modern lighting can contribute to human welfare, industrial production, business success, and human comfort.

WHAT IS THIS COURSE?

Westinghouse lighting engineers have collaborated with educational experts to produce a visual training course of the type used so effectively by the Armed Services and industry during the war. The course "package" consists of the following:

18 sound slide films and records • Handy pocket-size lesson books • Complete instructor's manual • Easy-to-use Lighting Handbook.

FOR WHOM IS IT DESIGNED?

Designed specifically for lighting sales personnel of electric service companies. Excellent both for training new salesmen and for "refreshing" experienced staff members. Each film is an authentic treatise on its subject, easily grasped and remembered.

WHAT DO OTHERS SAY ABOUT THE COURSE?

Sixty electric service companies already have the course and are enthusiastic about the part it will play in their lighting sales campaigns. Now is the time to prepare for your own intensified lighting sales activity.

HOW MUCH DOES IT COST?

Westinghouse pays the cost of preparation and initial production. Users are charged only the reproduction cost of kit materials.

One kit, complete, costs $225.00, and includes:

18 films and records
10 sets of 18 lesson books each
1 instruction manual • 1 lighting handbook

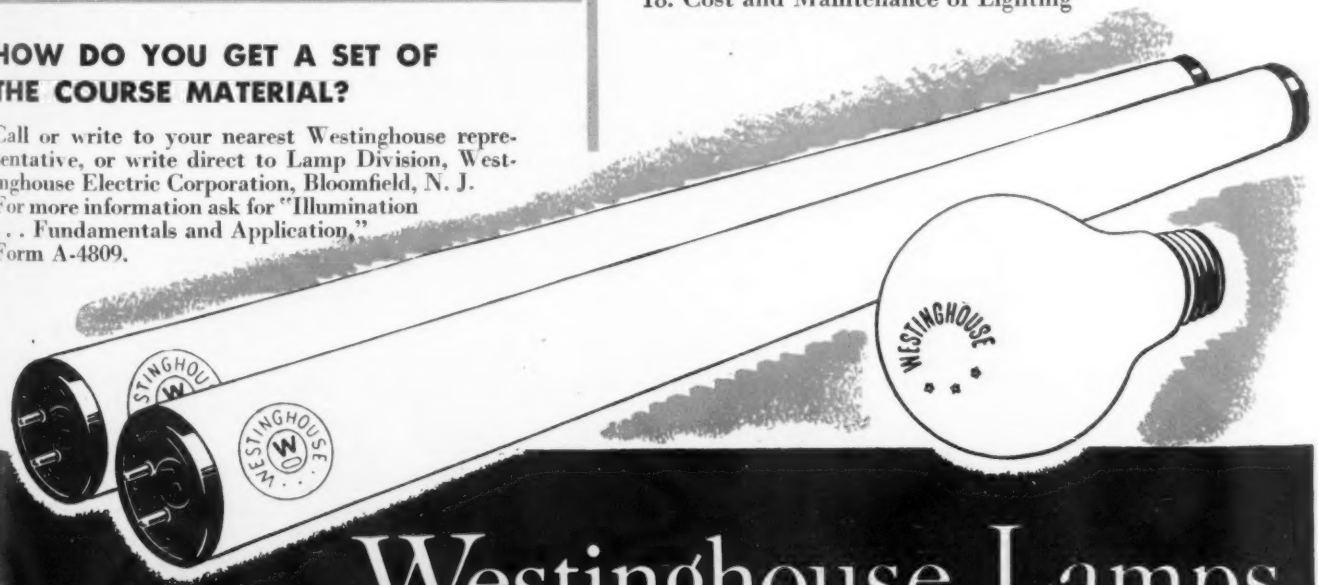
Extra lesson books are available at $2.50 per set of 18 books.

HOW DO YOU GET A SET OF THE COURSE MATERIAL?

Call or write to your nearest Westinghouse representative, or write direct to Lamp Division, Westinghouse Electric Corporation, Bloomfield, N. J. For more information ask for "Illumination . . . Fundamentals and Application," Form A-4809.

SUBJECTS OF THE 18 FILMS AND RECORDS YOU GET WITH THE COURSE

1. The Mechanism of the Human Eye
2. Light and Vision
3. Illumination Terminology
4. Quantity Requirements of Good Illumination
5. Quality Requirements of Good Illumination
6. Importance of Color in Illumination
7. The Incandescent Lamp
8. Electric Discharge Lamps
9. The Fluorescent Lamp
10. Principles of Light Control
11. Systems of Light Control
12. Calculation of Interior Illumination
13. Office Lighting
14. School Lighting
15. Store Lighting
16. Industrial Lighting
17. Floodlighting
18. Cost and Maintenance of Lighting



Westinghouse Lamps

FOR EVERY LIGHTING REQUIREMENT

WE START THE FINISH RIGHT.... TO MAKE IT END THE WAY IT'S WANTED

"Smooth as a baby's cheek— and baked on to stay!"

That's the way the Plant Superintendent likes to see fluorescent fixtures come off the line. His sensitive fingers and critical eye tell him his production figures are "right on the dime, friend; your stuff is KO."

There are many ways to bake a finish on metal. Whether the curing schedule requires five minutes or an hour, by gas or electric oven or by infra-red tunnel (illustrated), Fuller formulates a finish to fit.

Our synthetics, we are told, give better covering, better "mileage," higher gloss, more durable wear.

Such properties, important to water heaters, fixtures, refrigerators, air conditioning units, stoves and such, indicate the Fuller laboratory technique—look beyond the production line to a useful life for every Fuller-finished product.

In the general paint application field, too, Fuller always formulates in terms of final service, because *use* is the final proof of quality.

Whatever your surface protection or beautifying problem, we believe we can solve it. We've solved some tough ones. We're still on our mettle! W. P. Fuller & Co. Factories: San Francisco, Los Angeles, Portland. Branches, warehouses in principal Western cities.

FULLER *Industrial* FINISHES

PRODUCTION FINISHES

Many leading Western wood and metal finishers specify Fuller for production profit, sales appeal, buyer satisfaction.

MAINTENANCE FINISHES

Protection for equipment, plant machinery, buildings, offices, plus "Color Engineering" —Fuller products fit, suit, serve and save.

AIRCRAFT FINISHES

Millions of war flight-hours proved Fuller Aircraft Finish quality. Now available for private planes. See your Airport Refinisher.

Your Customer Wants

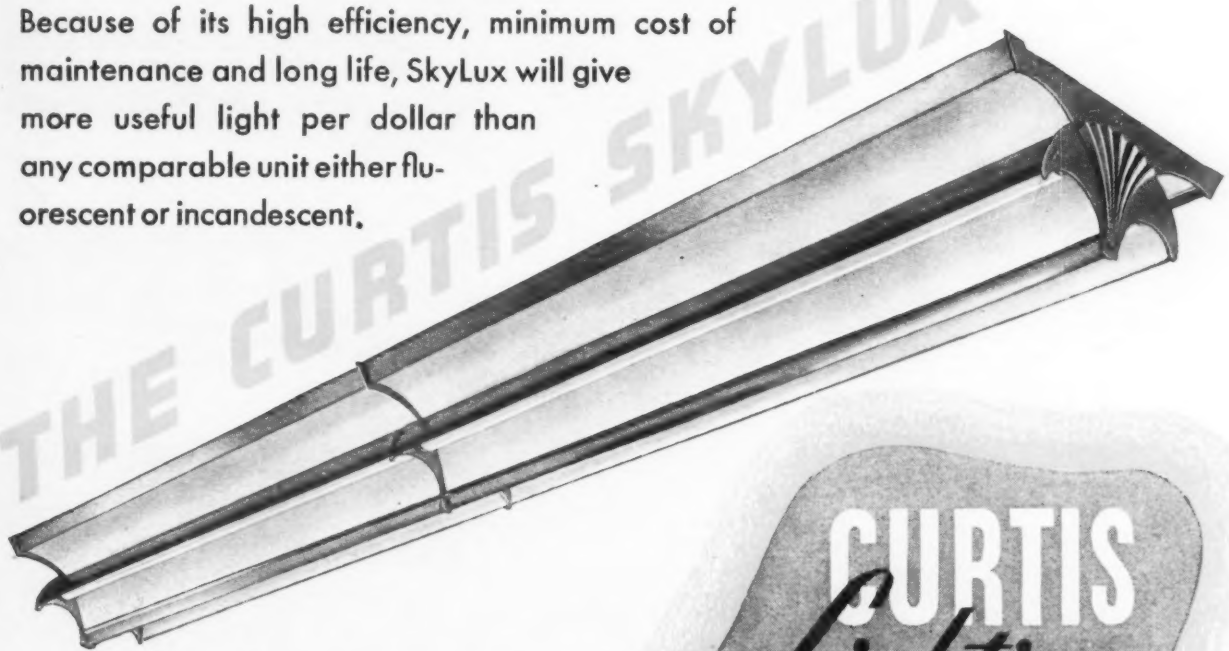
OVERALL LOW COST

CHOOSE THE LUMINAIRE THAT INSURES IT

When it gets right down to selling lighting, it is not only a question of initial unit cost. Your customer wants his overall cost of light to be as low as possible, consistent with a good lighting job. What really counts is how much his total cost of lighting will have been after three, five or ten years.

When you start figuring these costs and base your figures on the Curtis Twin SkyLux, you're on your way to an order.

Because of its high efficiency, minimum cost of maintenance and long life, SkyLux will give more useful light per dollar than any comparable unit either fluorescent or incandescent.



A four-foot luminaire for either pendant or ceiling mounting as individual units or continuous lines. Uses two 40-watt fluorescent lamps. High utilization; 90% of output is directed downward. Finished Satin Gray outside; reflectors finished Fluracite.

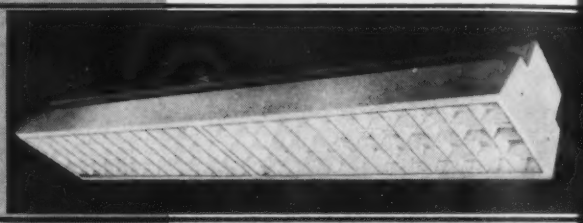
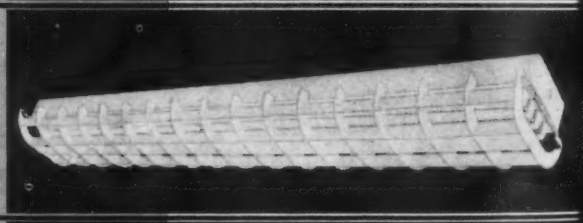
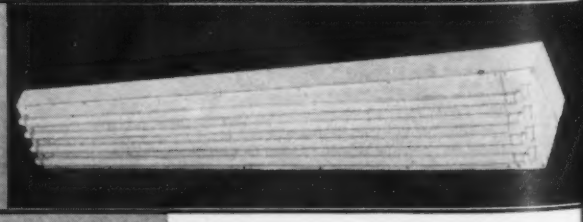
CURTIS
Lighting
INC.
6135 WEST 65th STREET
CHICAGO 38 • ILLINOIS

Now COLD CATHODE

ZEON

FEDERAL STRIPLITE BASE

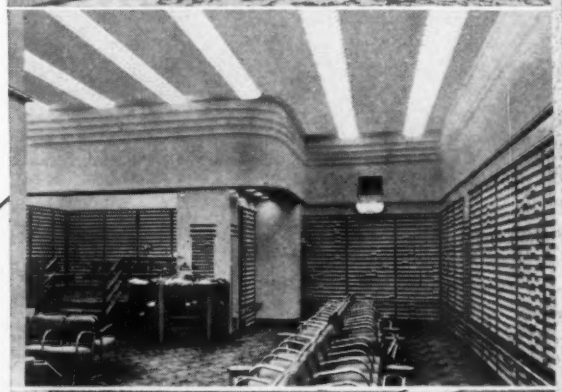
AND INTERCHANGEABLE ACCESSORIES

May be used as an open troffer or with flat louvers or diffusing "Sky-Tex" glass panels. An opening between the hood and the Striplite permits light to be reflected to the ceiling as well as downward. Suitable for surface or suspension mounting.	**HOOD ACCESSORY**	
Attractive curved louvers, for those who prefer partially concealed lamps, reduces brightness contrasts with minimum loss of efficiency. Louvers have hinging action for lamp accessibility. Suitable for surface or suspension mounting.	**CURVED ACCESSORY**	
Ideal for that recessed installation. Reflector easily detachable for cleaning without disturbing sockets or wiring. May be used open or with flat louvers or diffusing "Sky-Tex" glass panels.	**FLUSH ACCESSORY**	
Show windows properly illuminated. A maximum for display, with a minimum of outside "spill." For "quotation" boards, and neat appearance on beamed ceilings, too. Suitable for surface or suspension mounting.	**ANGLE ACCESSORY**	

Produces OVER 30 FIXTURE

FEDERAL ELECTRIC

simplified INSTALLATIONS



LESS TO STOCK!

Striplite bases contain all ballasts, sockets, and wiring. Accessories are completely interchangeable in the respective fixture sizes. A complete line of fixtures without duplicate stock of expensive parts or waste of warehouse space.

MORE TO SELL!

Long life and low depreciation of cold cathode lamps assures efficient operation with low maintenance costs. Appearance of installation may be completely changed without touching electrical connections by simply adding or substituting another accessory. Also: 1, 3, or 5-lamp units may be increased to 2, 4, or 6 lamps, respectively, by exchanging the socket plates and ballasts. Fixtures need not be removed.

EASIER TO INSTALL!

Convenient knockouts in all raceways are provided, for electrical connections, or suspension mounting. In all cases, Striplite sections mount independently, and accessories are added. Weight and bulk are thus reduced to a minimum. All electrical connections are completely accessible before, during, and after installation.

Dualite

Curvelite

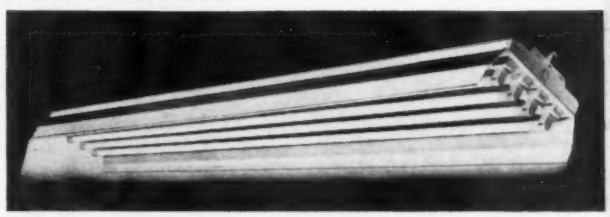
Flushlite

Anglelite

TYPES

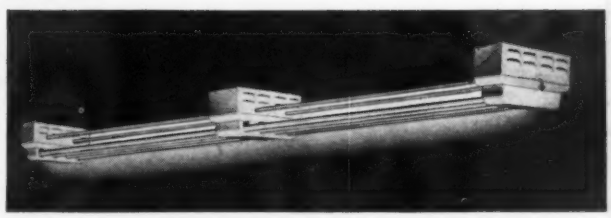
Industrialite

Extremely high reflector efficiency—over 91% in 4-lamp unit. May be installed as single 8′ units or in continuous rows. One single outlet will service 72′ of 4-lamp units.



Streamlite

Ultimate in simplicity—for stem or surface mountings. Minimum of fixture bulk, sockets and ballast concealed in easy to mount housings. May be used in continuous rows to reduce service wiring requirements. Only one outlet required for 72′ of 4-lamp units.



Lamps and fixtures fully guaranteed for one year (except lamp breakage). Available for immediate delivery. Ask your jobber or write to the Federal Electric Co., Inc., 8700 S. State St., Chicago 19, Illinois.

COMPANY, INC., CHICAGO 19, ILL.

LIGHTING SERVICE

includes much more than carrying a complete stock of fixtures

The General Electric Supply Corporation has a complete lighting service to offer. Experienced lighting specialists are available to all architects, contractors, engineers, or any client interested in a complete analysis of a lighting problem

- **INDUSTRIAL**
  Factories and Warehouses
- **COMMERCIAL**
  Stores and Offices
- **FLOODLIGHTING**
  Outdoor and Underwater

FLUORESCENT
INCANDESCENT

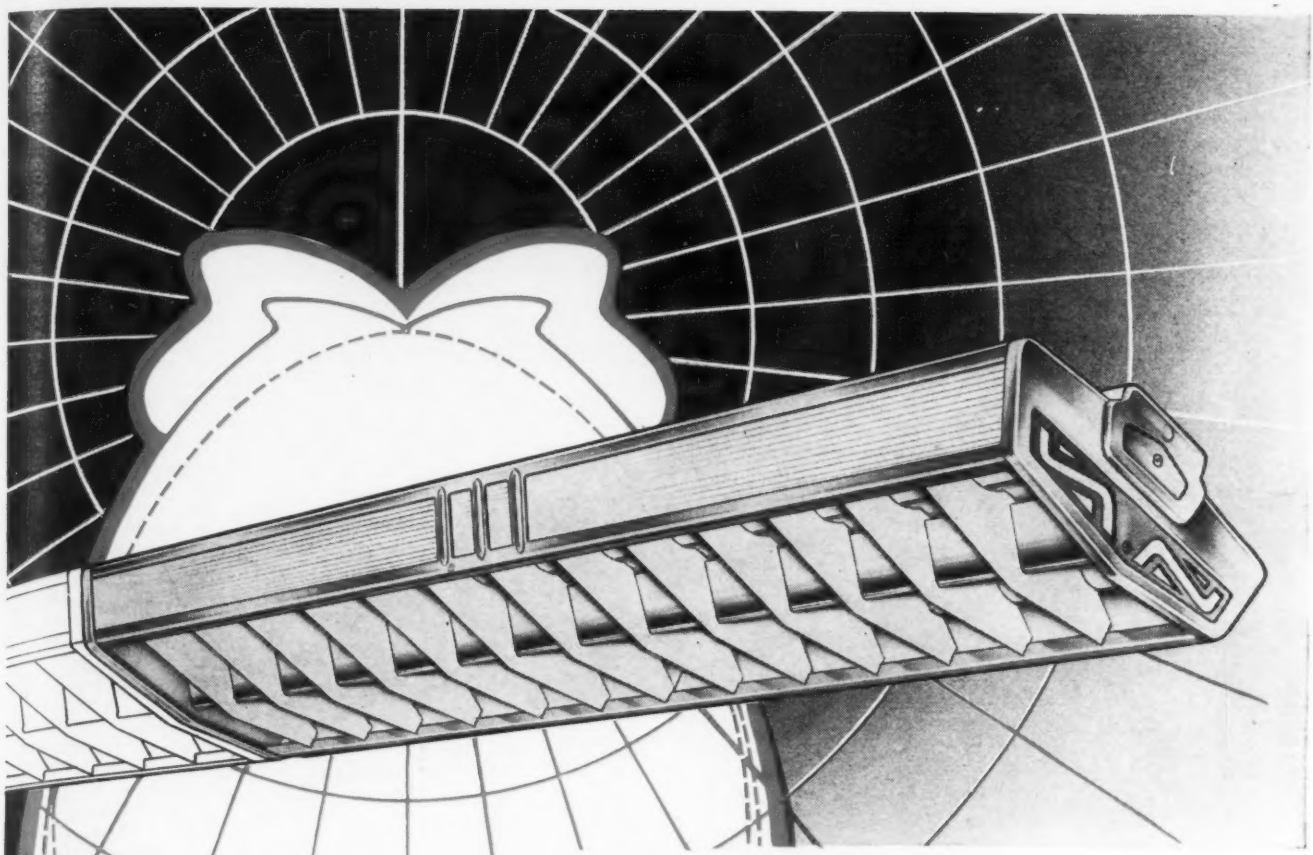
SPECIALIZED LIGHTING

When the problem of lighting involves specially designed fixtures or decorative lighting . . . our lighting specialists are available.

LOOK TO THE GENERAL ELECTRIC SUPPLY CORPORATION
FOR REAL HELP WITH YOUR LIGHTING PROBLEMS

GENERAL ELECTRIC SUPPLY CORPORATION

SAN FRANCISCO • OAKLAND • SACRAMENTO • FRESNO • LOS ANGELES
SAN DIEGO • SEATTLE • SPOKANE • PHOENIX • PORTLAND



FUNCTIONALLY DESIGNED ...OPTICALLY ENGINEERED

Modern, functional Day-Brite Fluorescent Fixtures combine better *light* with better *taste*.

Certified distribution curves prove their efficiency. A variety of pleasing designs to complement the architectural treatment of any installation requirement.

Send for our bulletins or consult your nearest Day-Brite Lighting Engineer for details.

***The* VIZ-AID**—Patent V-shaped ALZAK louvers assure more even distribution of glareless light and provide more light on the working plane. For continuous or unit mounting—surface or suspension. Designed for two 40-watt lamps. U. S. Patent No. D-138990—others pending.

Day-Brite Lighting, Inc., 5411 Bulwer Avenue, St. Louis 7, Mo.
Nationally distributed through leading electrical supply houses.
In Canada: **address all inquiries to Amalgamated Electric Corp., Ltd., Toronto 6, Ont.**

961

IT'S EASY TO SEE WHEN IT'S

DAY-BRITE *Lighting*

The West's Outstanding Lighting Equipment

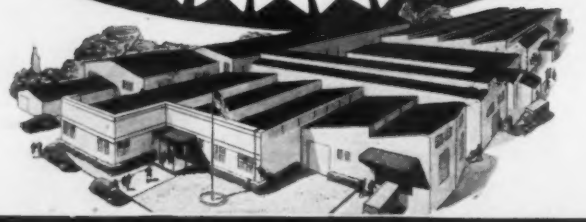
Users know from experience that the Smoot-Holman label is an assurance of quality. Look for it whenever you select lighting equipment, and be assured of outstanding service and trouble-free performance.

SMOOT-HOLMAN COMPANY

SMOOT-HOLMAN

INGLEWOOD, CALIFORNIA

MADE IN U.S.A.



Offices in Principal Western Cities—Branch and Warehouse in San Francisco

X-ray Photometer (915)

A new X-ray photometer indicates and records the concentration of one chemical element in the presence of others in solids, liquids or gases by measuring the change in absorption of X-rays between a sample and a standard. The photometer is offered by G-E for use in determining the ash content of coal, sulphur content of oil, hydrocarbon, chlorine or fluorine content of plastics, tetraethyl lead content of gasoline and bromine concentration in certain brominated compounds. The sensitivity of this method of analysis varies from 0.01 to 1%, depending upon the difference in atomic numbers of the components making up the specimens. The photometer is housed in a standard control cabinet, 72 in. high, 28 in. wide and 20 in. deep. It is announced as meeting ASA Class A standards Z54.1-1945, Safety Code for industrial use of X-rays.

Plastic Insulation (916)

A plastic insulating material which can be shrunk at room temperature around connectors, cable ends, busbars, tools and other pieces of electrical equipment has been developed by General Electric Co. and is available in caps, sleeving and tubing. Offered in colors, this plastic is said to have excellent heat resistance and to be unaffected by common solvents and acids encountered in painting, plating and degreasing operations. Previous to use these plastic products are soaked in a special dilator solution and swell to half again normal size. While dilated, they are slipped over the cable or other equipment and allowed to dry thoroughly, shrinking to smaller than original size. All products are shipped dry and can be stored in or out of the dilator.

Overload Signal (917)

Thermalarm, a device to indicate transformer overload, is offered by Eastern Specialty Co. A thermally responsive element controls a flag, which in its normal position is the color of the instrument case but, when reversed, becomes a brilliant red. The plastic case, which is attached to the transformer with adhesive cement, has a projecting aluminum base which acts as a heat transmission medium. According to the manufacturer, the signal is not intended to be a precision device but to act as an indicator that the transformer has at some period operated at an excessively high temperature.

Stripping Compound (918)

Riley & Geehr has announced Armatex No. 307, a thermoplastic stripping compound, green in color. The dipping range is 200 to 225°F. for application to armature shafts and motor coil connecting points prior to varnish, lacquer or wax impregnation. It is a single-dip application, sets instantly and average coating thickness is 75/1,000 of an inch and it is claimed that it will not remelt at oven baking range to 325°F. The compound is said to peel clean after complete cycle of baking operation.

Transformer (919)

A new Westinghouse CSPB transformer, designed especially for banked secondary operation, differs from the standard CSP transformer by addition of a secondary breaker and two extra low-voltage bushings for sectionalizing faulted or overloaded secondaries. These transformers are available in 10- and 15-kva. sizes in standard high-voltage ratings from 2,400 to 14,400 volts.

Rhythm in Colonial Brass and Modern Chromium

● There's perpetual beauty in the simple, graceful lines of these fixtures by Virden. There's also a quality of airiness that pleases the eye and proclaims good taste. More than that, there's the comfortable assurance of structural integrity and master craftsmanship that spells Virden Value. You can get them from your Virden jobber.

John C. Virden Company • Cleveland, Ohio

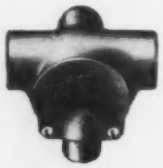
Member American Home Lighting Institute

CROUSE-HINDS

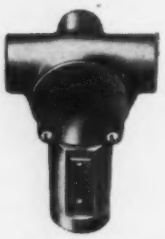
Flexible Fixture Hangers

easy to install — long life — low maintenance cost

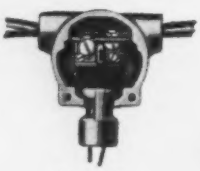
Type ALA Ball Hanger

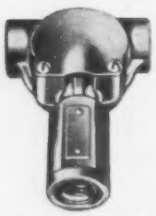

Type ALT Ball

Type ALA Cushion Hanger


Type ALT Cushion

Type ALC Ball
Broken-away view


Type ALC
with Connection Block
Cover Removed


Type ALC Cushion

Type AHG Cushion
Vaportight

Type ALL Ball

Type GS Ball

Type ALL Cushion

Type GS Cushion

Type H Cushion

The illustrations show a representative selection from the dozens of types and sizes of flexible lighting fixture hangers that are listed in Crouse-Hinds Condulet Catalog 2500.

No. 11
of a series of advertisements which demonstrate, that CROUSE-HINDS "complete line" means much more than just a range of sizes—there is a wide variety of highly specialized types in each classification.

Type UNJ Ball

Type UNJ Ball

Type ARB Ball

Type ARB Cushion

Type OFH Cushion

Type OFH Cushion with
Clamp for Span Wire

Type UNJC Cushion

Type UNJC Cushion

Type UNC Cushion

Type COUP Locking
Coupling for locking
fixture stem to
Condulet hub

Type OSA

Type UNH Hook
Male

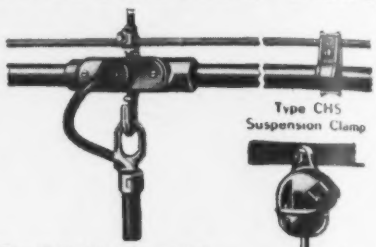
Type UNH Hook
Female

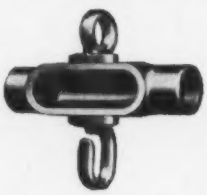
Type UNHC Cushion

Type UNE Loop
Male

Type UNE Loop
Female

Type FOH
for fluorescent
lighting fixtures


Type C Condulet Suspended
on a Span Wire with
Type OSA Suspension Hanger


Type C Condulet with
Fixture Hook and Loop

Type CHS Suspension
Clamp with Ring

Type ALC Ball
Fixture Hanger with
Lighting Fixture

Type CHS
Suspension Clamp

Type OFH Cushion
Fixture Hanger
Bolted to Structure
with Lighting Fixture

Type GS Ball
Fixture Hanger with
Type GSC Condulet
and Lighting Fixture

Type AHG Cushion
Fixture Hanger with
Type T Condulet and
Type VDA Lighting Fixture

A Nationwide Distribution Through Electrical Wholesalers

CROUSE-HINDS COMPANY
Syracuse 1, N. Y., U.S.A.

Offices: Birmingham — Boston — Buffalo — Chicago — Cincinnati — Cleveland — Dallas — Denver — Detroit — Houston — Kansas City — Los Angeles — Milwaukee — Minneapolis — New York
Philadelphia — Pittsburgh — San Francisco — Seattle — St. Louis — Washington *Resident Sales Engineers:* Albany — Atlanta — Charlotte — Indianapolis — New Orleans
CROUSE-HINDS COMPANY OF CANADA, LTD., *Main Office and Plant:* TORONTO, ONT.

CONDULETS · TRAFFIC SIGNALS · AIRPORT LIGHTING · FLOODLIGHTS

General Electric conduit is carefully selected from the best steel pipe—a pipe that will not open when bent. Two types are available—each specially coated for specific kinds of corrosion.

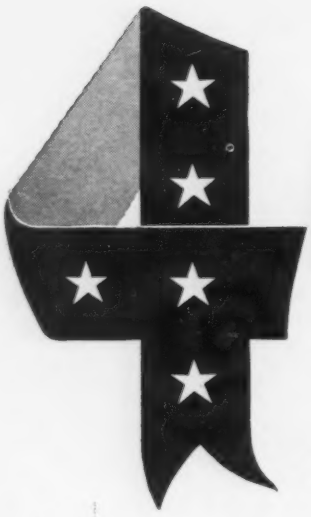
G-E White Conduit has a hot-dipped zinc coating that gives lasting protection against heat, cold, sunlight, condensation, rain and sleet—against all types of atmospheric corrosion.

G-E Black Conduit has a baked-enamel coating that gives lasting protection against acids, liquids, fumes, and oil—against all types of chemical corrosion.

Choose General Electric conduit where you require the best possible protection for wiring. Exhaustive factory tests assure you that G.E.'s rigid conduit will withstand the most rigorous conditions.

For further information, see the nearest G-E Merchandise Distributor or write to Section C1-918, Appliance and Merchandise Department, General Electric Company, Bridgeport, Conn.

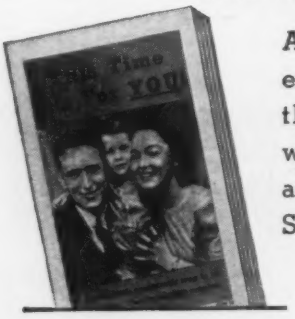
GENERAL ELECTRIC



helps to a healthy future

- **FOR YOU**
- **FOR YOUR COMPANY**
- **FOR AMERICA**

THIS TIME IT'S FOR YOU—

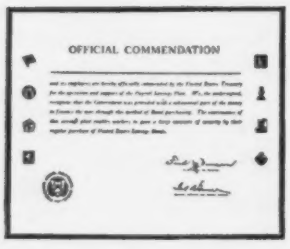


A booklet for employees . . . explaining graphically how the payroll savings plan works . . . goals to save for, and how to reach them with Saving Bonds.

OFFICIAL APPOINTMENT—

The person appointed Official U. S. Savings Bond Officer for his organization is entitled to display this two-color certificate of identification and the Treasury's appreciation of his service.

OFFICIAL COMMENDATION—



A red-white-and-blue certificate of commendation by the U. S. Treasury for every company operating the payroll savings plan. You can display it proudly, and it will remind people of the importance of the program.

THE PEACETIME PAYROLL SAVINGS PLAN—

A booklet, published for key executives by the Treasury Department, containing helpful suggestions on the conduct of your payroll savings plan for U.S. Savings Bonds.

Are You Using These Booklets?

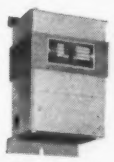
If you're not already using these helps to a healthy future, get in touch with your State Director of the Treasury Department Savings Bonds Division. And by all means keep up your payroll savings plan. It's a powerful weapon for the maintenance of a strong, secure economy — today and tomorrow!

The Treasury Department acknowledges with appreciation the publication of this message by

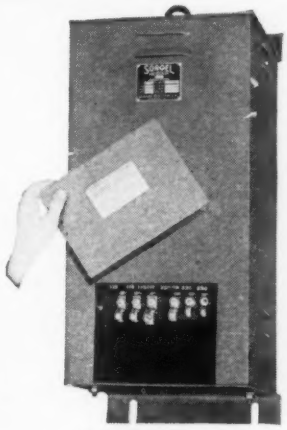
ELECTRICAL WEST

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and the Advertising Council

SORGEL AIR-COOLED TRANSFORMERS



1/4 KVA.
Single Phase
460/230 to
115 volt.



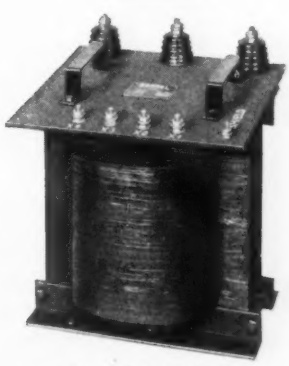
15 KVA. 3-phase
Showing connection compartment with solderless terminals

for Every Purpose

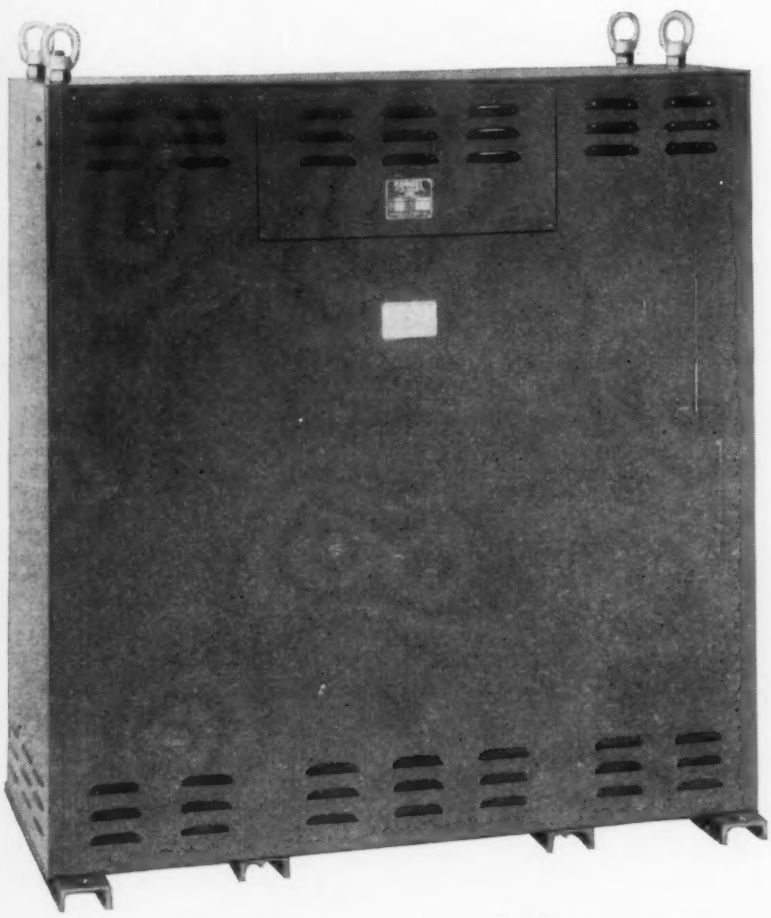
To operate 115 volt lighting and portable equipment from 230-460 or 575 volt power circuit.
¼ to 333 KVA. Single phase. 1 KVA. to 1,000 KVA. 3-phase.

To operate special equipment from standard circuits, to change odd voltages to standard voltages, and phase changing.

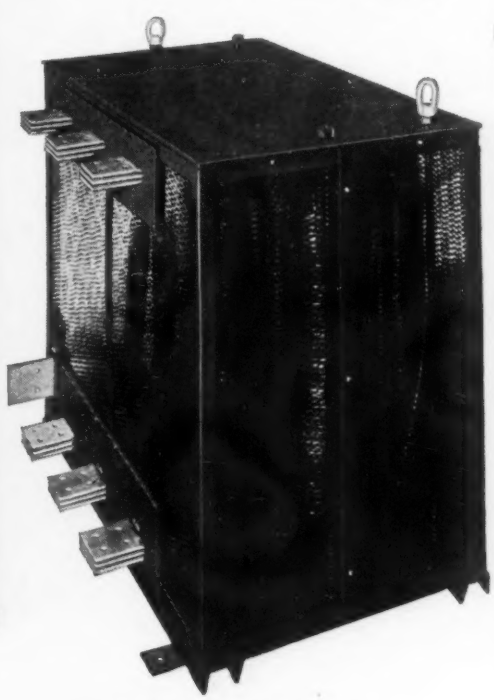
For interior high voltage distribution systems with transformers at load centers. Sizes up to 1,000 KVA. Voltages up to 13,200.



Special 4600 Volt
Electronic Transformer



500 KVA. 3-phase.
4160 Volt Transformer. For Indoor Sub-Stations



Booster Auto Transformer
1000 KVA. 3-phase. 208/120 to 240 volt.

SORGEL ELECTRIC CO.
844 W. National Ave., Milwaukee 4, Wis.

REPRESENTATIVES

FRED W. CARLSON
307 Wall, Seattle, Wash.
Rt. 6, Box 133, Portland, Ore.

CAMPBELL & GEORGE CO.
379 Brannan St., San Francisco

H. D. EASTERBROOK
1262 S. Boyle
Los Angeles 13, Calif.

The New Home of Lloyd PRODUCTS

Lloyd appreciates the patience and forbearance you have shown when overloaded manufacturing facilities slowed down delivery of Lloyd Flex-Loc Lamp Holders and Lloyd Automatic Starters. We are now at home in this large modern plant, where greatly increased facilities will make possible greater service to all our customers . . . service which we hope will match in quality the matchless Flex-Loc Lamp Holders and Lloyd Automatic Starters.

LLOYD POLICY INSURES QUALITY

651-F
FLEX-LOC Lamp Holder

Automatically self-adjusting. Engineered to fit ALL STANDARD spacings. POSITIVE AUTOMATIC LOCK. PERFECT ELECTRICAL CONTACT. Brass contacts grip BOTH sides of lamp pins securely.

Listed and Approved by Underwriters' Lab., Inc., and Canadian Standards Assoc., App. Division E.T.L. Test Report 314454 Available

Patented—Other patents pending.

FS-40
AUTOMATIC Starter

CUTS OUT deactivated or flickering lamps. CUTS OUT current to lamp and ballast. Increases life of lamp and ballast.

Listed and Approved by Underwriters' Lab., Inc.

Certified by E.T.L., Spec. 6
Pat. Nos. 2200443-2228210

LLOYD PRODUCTS CO.
PROVIDENCE 5 RHODE ISLAND

FRANK H. BRAN CO.
400 E. 3rd St., Los Angeles

W. G. BRUCE CO.
2028 S.W. Yamhill St., Portland, Ore.

FRANK H. BRAN CO.
894 Folsom St., San Francisco

HARVEY M. OLMSTEAD
1534 Warren St., Denver

WILLIAM H. SANDERLIN, 129 First Ave., Seattle

Welder Control (920)

Providing automatic control of air operated resistance welding machines, a new Class 8992 combination control unit is available from Square D. A Syncro-Break welder contactor and Safront sequence-weld timer are included in a single enclosure arranged to mount on the right hand side of the machine. Foot, pressure, no-weld switches and timer control circuits operate at 110 volts and are isolated from the power supply for safety. Combination controllers are designed with a control circuit, which may be either separate or common with the power circuit. Standard controllers have tapped primary control transformers which can be connected for operation at 110, 220 or 440 volts, 60 cycles or for 380 volts, 50 cycles. Other voltages and frequencies are available on special order.

Testing Equipment (921)

A new line of portable testing equipment for voltages from 1,000 to 35,000 is offered by Safety Electric Equipment Co. The manufacturer states that in these detectors the current is first reduced to a non-hazardous value by current-limiting resistors in the top of each staff, and the current in the cable between the main and auxiliary staffs is approximately 7% or less of 9 ma. In wet weather, voltage creepage that comes down the outside of the staffs is carried to ground before it can come in contact with the operator, it is claimed.

Tachometer (922)

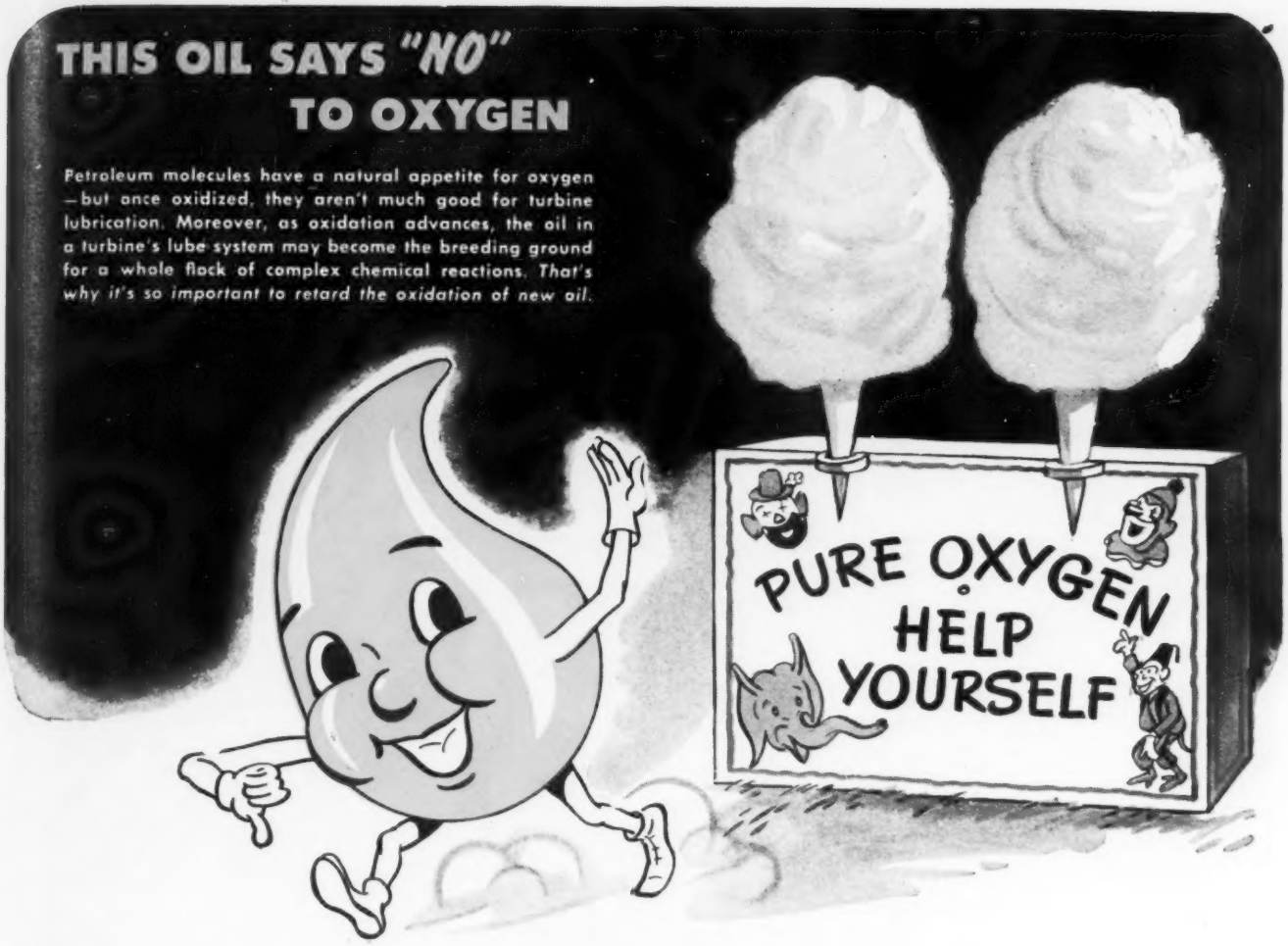
Ideal Industries has a new "panel type" tachometer designed particularly for use where the generator must be mounted permanently on a machine and the meter on a panel removed from the generator. The generator consists of a small, permanent "alnico" magnet rotor mounted on ball bearings and capable of continuous operation at any speed within the limit of the meter, which is a rectifier type and is said to withstand a momentary overload up to four times the maximum speed indication. Meters are available in 3- and 7-in. sizes and in 0-1,250, 0-2,500 and 0-5,000 r.p.m.

Immersion Heater (923)

Edwin L. Wiegand Co.'s Chromalox Type BLC portable drum immersion heater is available for 115- or 230-volt, single-phase current in ratings up to 4,400 watts. It is designed for melting solid oil, greases and similar compounds in standard 55-gal. drums by allowing the heater to melt its way down through the contents. To eliminate cold areas, steel-sheathed heating elements form almost a complete circle around a tubular unit located in the center.

Plastic Cap (924)

Amerline is making a plastic safety cap for electrical outlets. This transparent cap fits the standard 110- or 220-volt openings.


THIS OIL SAYS "NO" TO OXYGEN
Petroleum molecules have a natural appetite for oxygen—but once oxidized, they aren't much good for turbine lubrication. Moreover, as oxidation advances, the oil in a turbine's lube system may become the breeding ground for a whole flock of complex chemical reactions. That's why it's so important to retard the oxidation of new oil.
PURE OXYGEN
HELP
YOURSELF

Why Shell Turbo Oils
COUNTERACT OXIDATION AND RUSTING
in your turbine's lubricating system

SHELL TURBO OILS show little or no oxidation after years of service in industrial, marine, and public utility turbines. They have successfully prevented rust in these installations.

By counteracting the progressive effects of oxidation, the life of the lubricating oil has been extended far beyond what was thought possible a few years ago. It has been accomplished by four important refining steps:

1. Shell employs scientific selection of crude stocks.
2. Shell's special refining removes all readily oxidized compounds. This also results in better demulsibility.
3. Shell fortifies Turbo Oil with an effective anti-oxidant. Again, by retarding oxidation, better demulsibility is retained.
4. Shell fortifies Turbo Oil with a rust preventive. The elimination of rust is vital to the oil as well as the machine.

The Shell Lubrication Engineer will give you sound advice about your turbine lubricating problems.

For literature about turbine lubrication and turbine cleaning procedures, write to Shell Oil Company, Incorporated, 50 W. 50th St., New York 20, N. Y.; or 100 Bush St., San Francisco 6, Calif.

SHELL

SHELL TURBO OIL

FWDs "Carry a lot of weight"

...in difficult utility line construction and maintenance

Proved in performance as the "ONE truck for MANY jobs", FWD four-wheel-drive trucks "carry a lot of weight" with utility line construction and maintenance men. Engineered to go in anywhere, pull out of anything, on or off the highway, FWDs match the unconquerable spirit of the utility men, to whom no emergency is too great a challenge.

In the service of more than 150 utilities... some of them operating fleets of 200 or more FWDs ... these rugged, dependable four-wheel-drive trucks, equipped with special utility bodies, take men and equipment, fast, wherever construction or maintenance work requires. On all of the many jobs FWDs do well, they also work economically. See the nearest FWD distributor or write to...

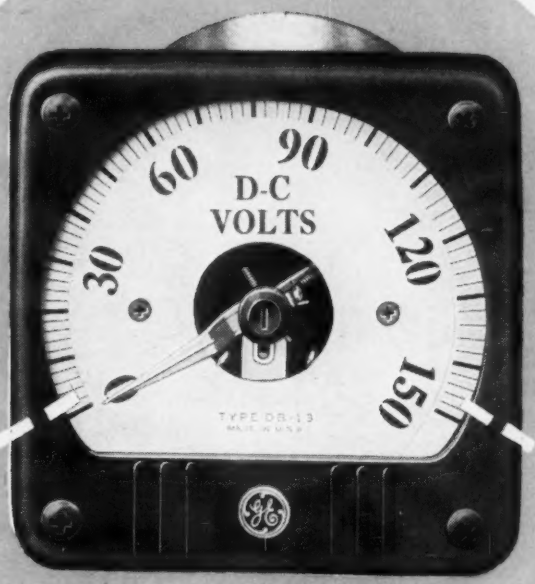
THE FOUR WHEEL DRIVE AUTO COMPANY, Clintonville, Wis.
Canadian Factory: KITCHENER, ONTARIO

America's Foremost FWD *Heavy Duty Truck*

National Distributors—Graybar Electric Company

REGIONAL SALES AND SERVICE: Arizona-Cedar Rapids Co., 401 N. First St., Phoenix; CALIFORNIA—The Four Wheel Drive Auto Co., 1339 Santa Fe Ave., Los Angeles 21 and FWD Pacific Co., 469 Bryant St., San Francisco 7; COLORADO—Liberty Trucks & Parts Co., P. O. Box 1889, Denver 1; IDAHO—Intermountain Equipment Company, Broadway at Myrtle St., Boise; MONTANA—Steffeck Equipment Co., 11 E. Cutler St., Helena; NEVADA—Allied Equipment Co., Reno; NEW MEXICO—The Myers Company, Las Cruces; OKLAHOMA—Halliburton Oil Well Cementing Co., P. O. Drawer 471; Duncan; OREGON—Feenaughty Machinery Co., 112 S. E. Belmont St., Portland 14; UTAH—Cate Equipment Co., 49 E. 9th So., Salt Lake City; WASHINGTON—Feenaughty Machinery Co., 1028 6th Ave., So. Seattle 2, Glenn Carrington & Co., 91 Columbia St., Seattle and Feenaughty Machinery Co., 715 N. Division St.; Spokane; WYOMING—Wortham Machinery Co., 517 W. 17th St., Cheyenne; ALASKA—Glenn Carrington & Co., Nome, Fairbanks, Anchorage, and The Graybar Electric Co., in over 90 principal cities.

a 4 1/4" instrument with a 7" scale



TYPES

AB-13—A-C

DB-13—D-C

VOLTMETERS
A-C & D-C

AMMETERS
A-C & D-C

WATTMETERS

VARMETERS

POWER-FACTOR METERS

SYNCHROSCOPES

FREQUENCY METERS

ALSO

Temperature Meters

Tachometers

Easy to read—accurately

Concentric-scale instruments mean a 36 per cent longer scale in 40 per cent of the panel space—for that is the comparison between the G-E long-scale, 4¼-inch switchboard instrument and the conventional-scale, six-inch rectangular, semiflush switchboard instrument. Here is what the long (7-inch) scale, spanning 240 degrees, means to you:

For voltage—The extra length permits more precise control of station bus voltage. See how easy it is to read to one volt on the scale.

For current—Readings can be taken from full scale down to approximately 10 per cent of this value, thus extending the useful range.

For power—Wattmeters and varmeters not only have long scales, but the divisions are evenly spaced throughout—an added advantage contributing to more accurate readings.

For frequency—The 7-inch scale, calibrated 55-65 cycles, permits closer readings; more precise control.

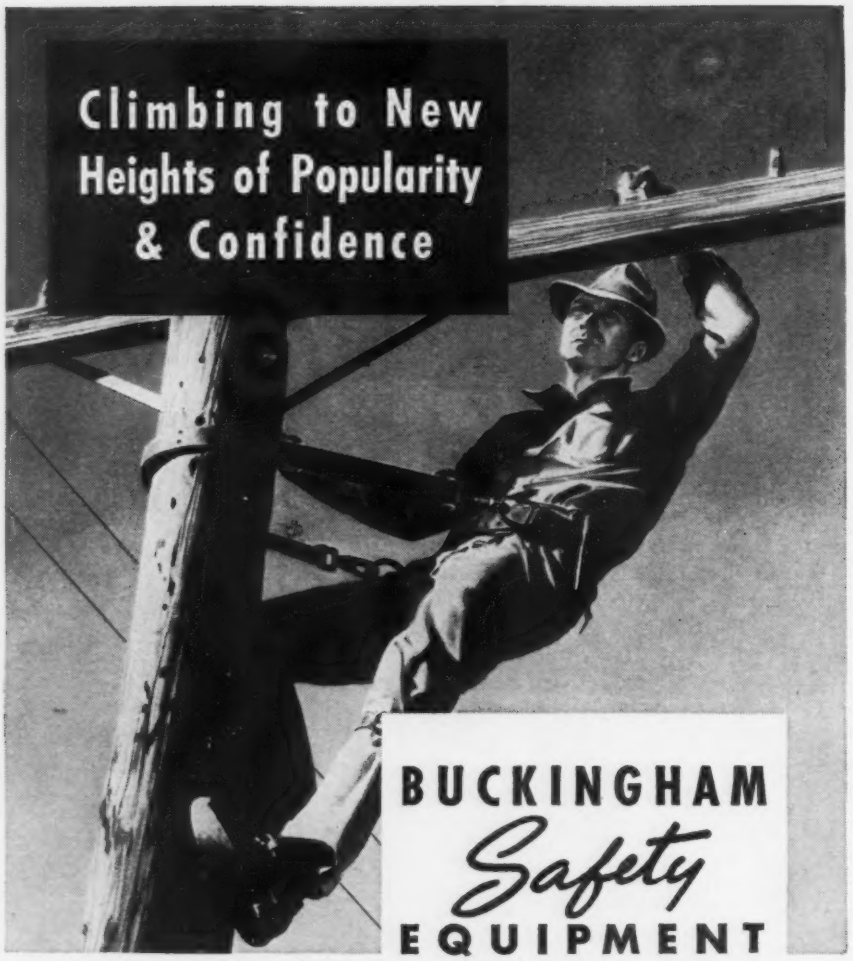
For temperature—The scale, nearly twice as long as usual, permits closer watch over critical heating.

Other accuracy features—One per-cent accuracy rating, thorough shielding, antiparallax scale and pointer, and non-glare glass.

Insist on G-E concentric-scale instruments for all new installations. Write your nearest G-E sales office for Bulletin GEA-3432. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

HEADQUARTERS FOR MEASUREMENTS

GENERAL ELECTRIC



For 45 years, Buckingham safety equipment has guarded the linesman's life and limb from accident and carelessness. For 45 years, it has kept him *comfortable* as well as safe.

That's why today Buckingham equipment enjoys demand and popular confidence never before equalled in Buckingham history . . . why expanded Buckingham facilities are turning out more safety equipment than in any previous year.

Stephens Climbers

Exclusively manufactured by Buckingham for 45 years, the Stephens Climber is world-famous for its quality and safety features.

★ With production up 50% — and still going higher — opportunity for Buckingham distributors is improving every day. If you're a qualified distributor in open territory . . . if you want a reputable line upon which you can build solidly for the future . . . write today for complete details.

Buckingham Easy Belt No. 58

Safe and comfortable, it's made of tan harness leather, lined with soft chrome lace-leather. No metal contact with the body. Forged Dee-ring and buckles are individually tested.

Write for Catalogue 24 showing the complete Buckingham line.

Buckingham MANUFACTURING CO., INC.

Walter E. Craw, President **5-7 Travis Street, Binghamton, N. Y.**

Distributed by: **The Western Hardware & Tool Co., 9th & Missions Sts., San Francisco 3, Calif.**

Autoswitch (925)

To check load lines and determine if additional power-factor correction is needed, a watt-var autoswitch which records on a single instrument is available from General Electric. Watts and vars appear on the same chart with a slight difference in density depending on setting of the timer inside the autoswitch. A typical installation, according to the company, consists of an inkless recording wattmeter, the watt-var autoswitch and suitable current and potential transformers.

Photoelectric Controls (926)

Photoswitch is offering Series 20 and 21 general-purpose industrial photoelectric controls. In this instrument, the double-pole, double-throw relay operates in 1/20 sec.; operating range is 20 ft.; relay operation is at any predetermined level of illumination within the range of 10 to 50 ft.-candles. The device operates on 115 or 230 volts, 50 or 60 cycles a-c. Contacts are pure silver. Maximum rating: 10 amp., 115 volts a-c, 5 amp., 230 volts a-c, non inductive ½ hp., 115/230 volts a-c, with both poles in parallel.

Meter Body (927)

Brown Instrument Co. has introduced an electric meter body with sealed armature. According to the manufacturer, this meter body was developed to meet specific requirements of the chemical and petroleum industries, particularly for measuring flow of viscous liquids. It is self venting, high-pressure connections being located above the float chamber. The armature assembly is sealed, protected and lubricated by a mercury fill, being repositioned by smaller variations in differential pressure.

Water Repellent (928)

A water-repellent material, called Dri-film, is being used by G-E on certain types of fluorescent lamps to form an invisible and permanent "rain coat" which makes for faster starting. In tests, lamps coated with the material have operated satisfactorily under 100% relative humidity. Dri-film was first used by G-E during the war for treatment of ceramic insulators for radio and other communication equipment.

Indicator (929)

W. C. Dillon & Co. is now making the Tens-O-Trol, electric remote tension and weight indicator. This unit is a combination of the company's Dynamometer and self-synchronous motors. With the new device, remote repeater stations may be as far as 300 ft. from the Dynamometer, the manufacturer states.

Filter Capacitor (930)

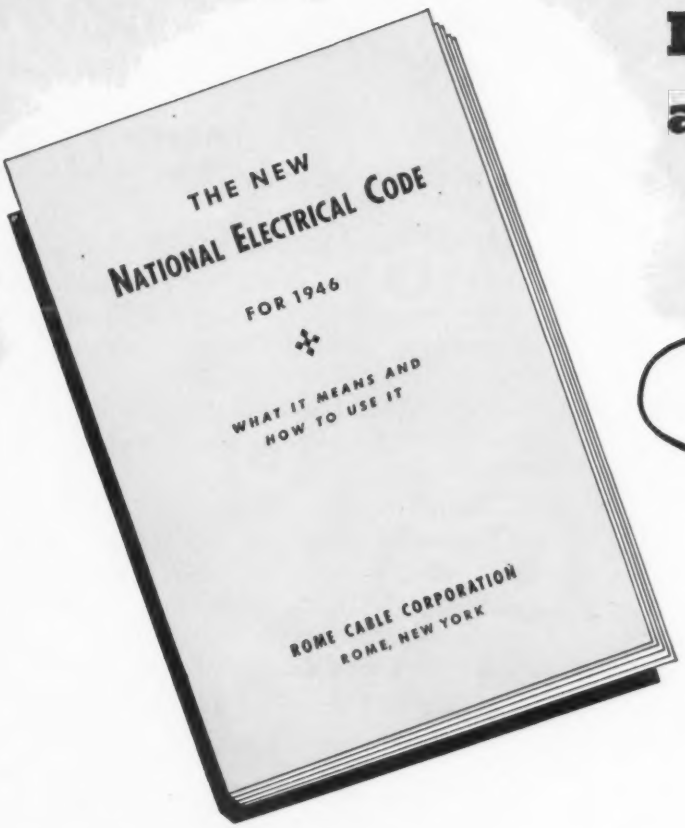
For applications where communications equipment is installed on heavy transportation conveyances, Cornell-Dubilier has a new Type MC vehicular filter capacitor. This unit is hermetically sealed, oil impregnated and oil filled.

Glass Fuse Plug (931)

Eagle Electric Mfg. Co. is making a glass fuse plug incorporating its OK feature indicating blown fuse, overload or dead short. Available in standard sizes, packed five to a box.

THE NEW 1946 CODE

Provides for Improved Wires and Cables



The qualitative improvement of insulating compounds is "part and parcel" of the New 1946 Code. Although not mandatory until November 1, 1946, Rome Cable has been producing wire to this new Underwriters' Laboratories ruling for some time. Therefore, the advantages of these better wires and cables are *currently* yours when you buy Rome Cable Building Wires.

Illustrated above is a recent Rome Cable publication, entitled "The New National Electrical Code for 1946." This handy and informative booklet analyzes in detail the provisions of the New Code. Arranged for quick reference, this booklet should benefit every purchaser and user of wire and cable. Copies are available upon request. Write for yours today.

CHECK THESE ADVANTAGES:

Temperature rating increased from 50° C to 60° C for Types R and RW.

Current carrying capacities for Type R approximately the same as previously permitted for Type RP.

Insulation thickness on sizes 14 AWG and 12 AWG (Types R and RH) reduced to 1/32", resulting in smaller overall diameters.

Increased aging characteristics for Type R.

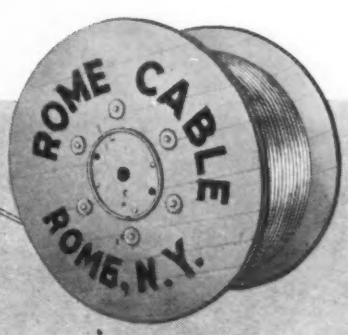
Type T and TW recognized for general use in sizes 14 AWG through 4/0 AWG.

Simplification through elimination of Types RP, RHT, and RPT.

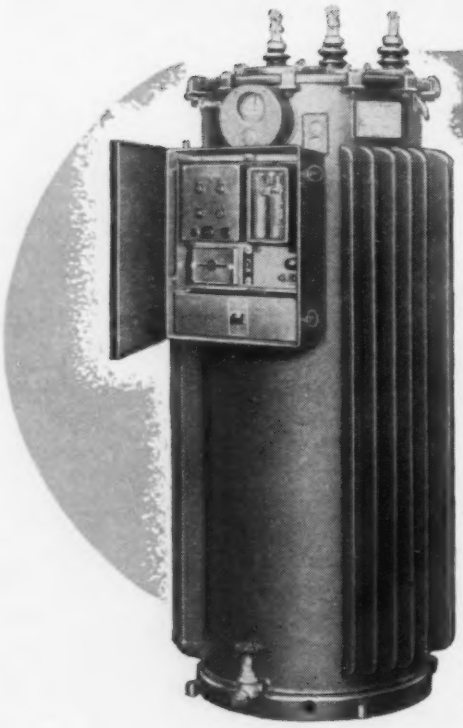
FROM BAR TO FINISHED WIRE

ROME CABLE CORPORATION

ROME • NEW YORK



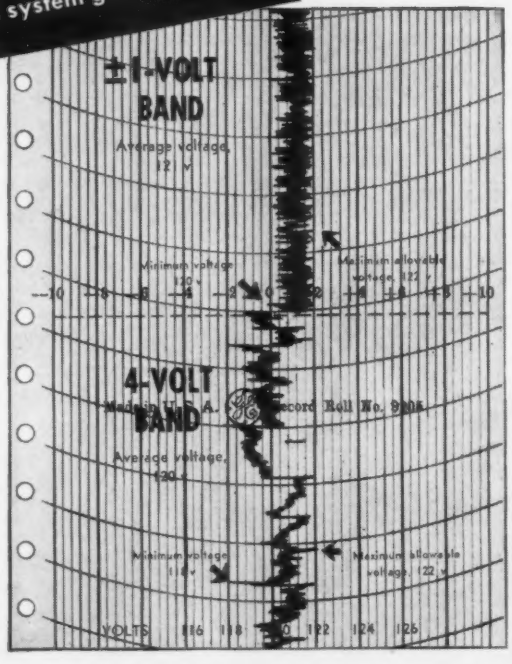
THERE'S PROFIT IN A G-E INDUCTION REGULATOR'S "Split-Second" ACCURACY



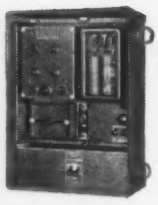
OPERATION records show that the ±1-volt narrow band width maintained by a G-E induction voltage regulator can recover lost revenue amounting to $1000 on a single feeder. Looking at it in other ways, the advantages obtained from this narrow band width can allow a 30 per cent feeder extension, an increase of 67 per cent in load—or a 1-volt higher average voltage at the customer's meter.

The narrower band width of a G-E induction voltage regulator can result in system economies which will pay for your regulator in a short time. Ask your G-E representative to show you how you can profit by using a G-E induction regulator, or write to *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.* for Bulletin GET-1375 containing simplified charts which show you these gains.

± 1-volt precision band width — without time delay — gives control advantages that result in both revenue and system gains.

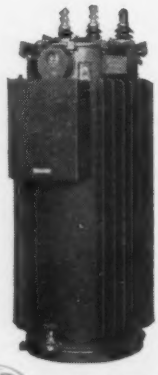


THIS PRECISION VOLTAGE REGULATING RELAY REQUIRES NO TIME DELAY— INSTANT RESPONSE RESULTS IN A ±1-VOLT BAND WIDTH CONTROL



1. A G-E induction regulator, like an electric motor, has a rotor mounted on roller bearings. It can operate an indefinite number of times without perceptible wear.

2. The G-E voltage regulating relay causes the regulator rotor to make a precise adjustment whenever the voltage reaches the limits of the ±1-volt band width.

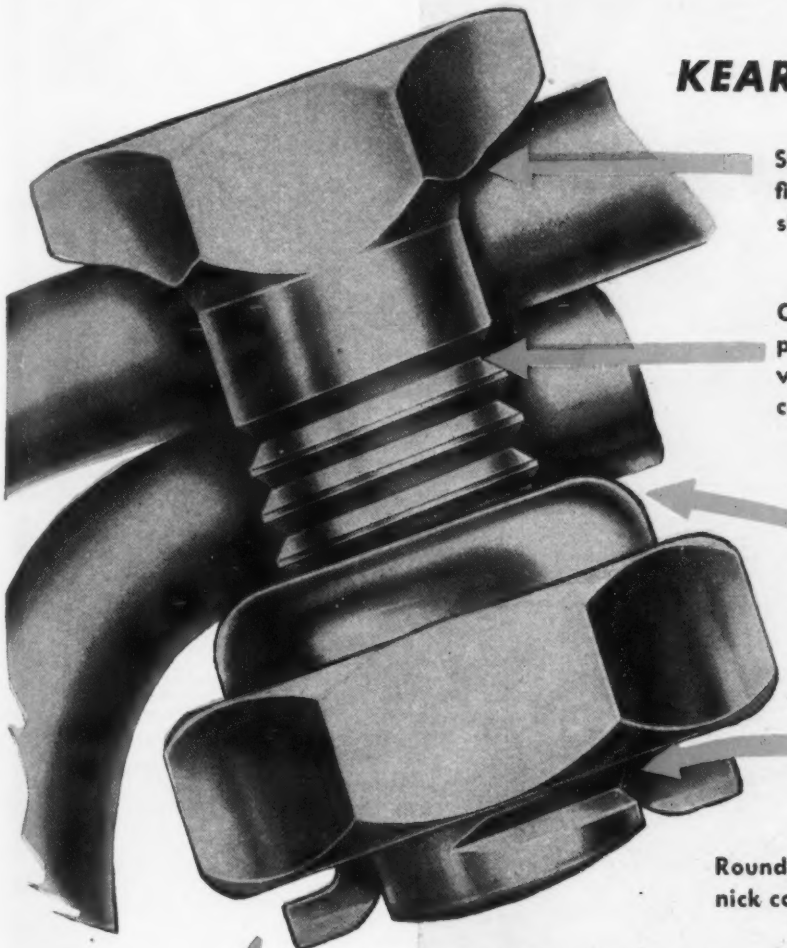


3. The G-E voltage regulating relay can be easily adjusted to meet your requirements of voltage level, band width, and holding effect, independent of one another. Once the settings are made, the relay can be relied upon to hold band width with unfailing accuracy.

GENERAL ELECTRIC

404-47-5400

Better Construction Today—
Less Maintenance Tomorrow



KEARNEY CON-NEC-TITES

Strong, hexagonal head provides firm wrench seating — prevents slipping

Clean threads and correct slot width provide smooth engagement, prevent stripping and binding on conductors

Long V-groove surfaces in washer and head assure maximum conductivity and eliminate bent conductors

Thread pilot makes possible easy starting.

Rounded edges won't cut gloves or nick conductors

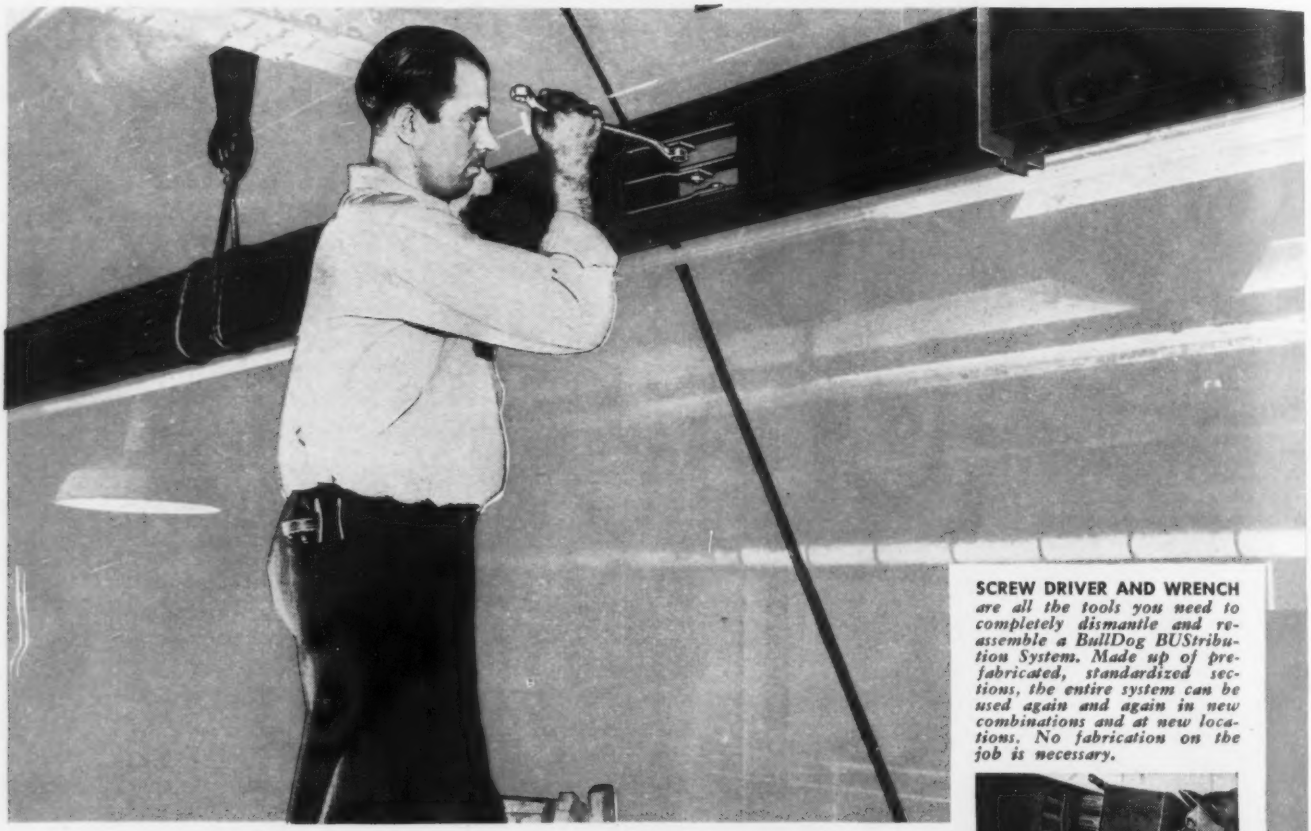
Specify

Kearney solderless Con-Nec-Tites provide permanent, positive electrical connections. They are fast and easy to use—save time and reduce costs. They are sturdy and made of weather resistant material. Available for all combinations or metallic conductors.

KEARNEY PRODUCTS

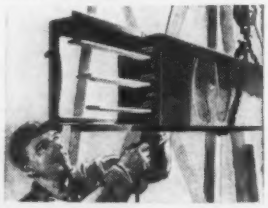
MAYDWELL & HARTZELL
INCORPORATED
LOS ANGELES • SAN FRANCISCO • PORTLAND

Power line relocated . . . all material salvaged



SCREW DRIVER AND WRENCH *are all the tools you need to completely dismantle and reassemble a BullDog BUStribution System. Made up of prefabricated, standardized sections, the entire system can be used again and again in new combinations and at new locations. No fabrication on the job is necessary.*

NO WAITING FOR POWER *with a BUStribution System—simply raise the plug to the nearest plug-in opening, snap its contact fingers over the busbar conductors and bolt the plug to the duct casing. The plug itself is a current protective device for the machine it serves.*



NO SCRAP WITH ANY MOVE! *There is no waste when you move a BullDog BUStribution System from one location to another. The component materials—steel duct, copper bus bars and vitreous porcelain—do not readily deteriorate and can be used indefinitely.*

Capacities: Feeder type—600 amps. to 4,000 amps.; Plug-in type—225 amps. to 1,350 amps.

You Can Do It With BullDog BUStribution DUCT

Manufacturers with an eye on tomorrow look to BullDog BUStribution DUCT for plug-in power supply, because this flexible bus duct system is *engineered for the future.*

"Moving day" in your plant can mean the time when your electrical system must be relocated, a new machine installed, or an old one shifted. In any case, BUStribution DUCT is ready for the change.

Built in standardized, prefabricated sections, it can be dismantled, moved and reassembled without scrapping a single nut or bolt. And when you shift a machine, the circuit protective plug moves right with it for easy mounting at the nearest plug-in opening. No cutting power . . . no tapping in "hot"—no lost production time.

Write for detailed descriptive folders. Or, better still, consult a BullDog field engineer who can show you a BullDog installation near your own plant.

BullDog Also Manufactures Vacu-Break Safety Switches—SafToFuse Panelboards—Switchboards—Circuit Master Breakers—Industrial Trol-E-DUCT for Portable Tools, Cranes and Hoists—Universal Trol-E-DUCT for completely flexible lighting.

BULLDOG

ELECTRICAL DISTRIBUTION SYSTEMS

BULLDOG ELECTRIC PRODUCTS COMPANY, BOX 177, R. PK. ANNEX, DETROIT 32, MICHIGAN. In Canada: BullDog Electric Products, Ltd., Toronto. Field Engineering Offices in All Principal Cities

CONSULT THE FOLLOWING PACIFIC COAST REPRESENTATIVES:

Coast Electric & Manufacturing Co.
1720 N.E. Sixth Avenue
Portland, Oregon, Tel. Garfield 2844

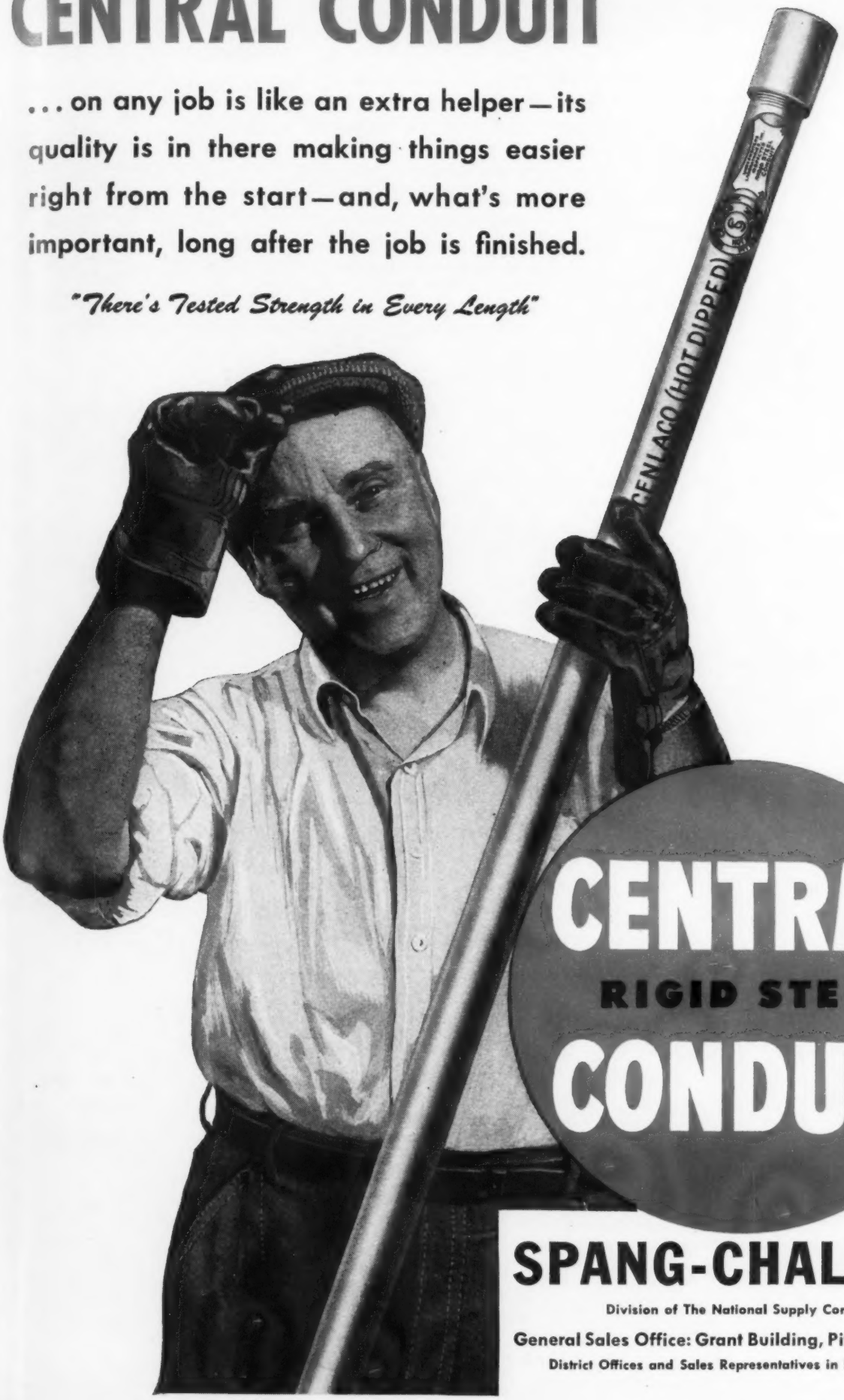
Safety Switchboard Company
1445 Stevenson St.
San Francisco, Calif., Tel. Hemlock 2470

Mullenbach Electrical Manufacturing Co.
2300 East 27th Street
Los Angeles, Calif., Tel. Jefferson 2224

CENTRAL CONDUIT

... on any job is like an extra helper—its quality is in there making things easier right from the start—and, what's more important, long after the job is finished.

"There's Tested Strength in Every Length"



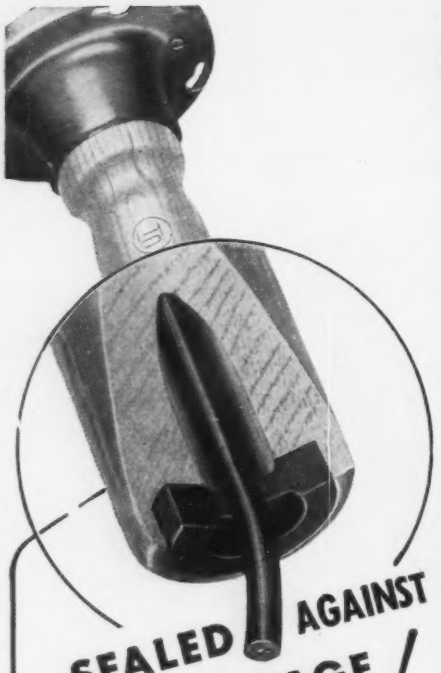
CENTRAL
RIGID STEEL
CONDUIT

SPANG-CHALFANT

Division of The National Supply Company

General Sales Office: Grant Building, Pittsburgh 30, Pa.

District Offices and Sales Representatives in Principal Cities



SEALED AGAINST SEEPAGE!

McGILL LAMP GUARD HANDLES

No. 4675

No. 8000

A live red rubber gasket, solidly cemented into the end of the handle adds still another safety feature to all McGill wood - handle Lamp Guards. Flexible, yet firm, the rubber gasket grips the cord closely as it enters the handle. The snug fit makes a moisture-proof seal which positively bars dangerous water seepage . . . holds the cord away from the sides of the channel, preventing the cord-fray which means shorts and shocks. There are more than seventy portable wood - handle lamp guard types in the comprehensive McGill line . . . all of them designed for maximum safety. Other safety and convenience features include handy thumb switch, cage heavily plated to prevent corrosion, Levolier socket and sturdy hardwood handle. Write direct or ask your wholesaler for more information on "Safety-First" McGill Lamp Guards . . . for every lamp use in industry.

Electrical Division

McGILL MANUFACTURING CO., INC.
VALPARAISO, INDIANA

BULLETINS

data books, etc.

Bus Duct (932)

A 40-page data booklet on bus duct is available from Westinghouse. This illustrated booklet analyzes three typical bus duct installations. The engineering data section includes standard ratings of main breakers, temperature conversion tables, formulas for determining amperes, horsepower, kilowatts and kilovolt-amperes, and load power factor curves.

Data Book (933)

Allis-Chalmers is offering a 16-page letter-size handbook on its electrical products. Well illustrated, this publication includes data on a-c and d-c motors of from ½ to 50,000 hp., electronic heaters, control equipment, multiple V-belt drives, transformers, switchboards, switchgear and circuit breakers, equipment for power generation, welding equipment.

Current Transformer (934)

R. E. Uptegraff Mfg. Co.'s Bulletin No. 120 tells about the company's redesigned Type CR current transformer for circuits up to 5,000 volts. According to the manufacturer, this improved type is sufficiently accurate for all metering purposes up to 50-va. burden and accurate within 1% up to 200-va. burden.

Coffee Makers (935)

A 16-page booklet issued by Silex describes the company's glass coffee makers, electric and range models, and its duoelectric steam iron.

Mercury Switches (936)

Minneapolis-Honeywell mercury switches are described in a 15-page booklet recently made available. Among the company's 66 basic models are switches for direct control of electrical loads rated up to 50 amp., and devices for waterproof application and for use in ambient temperatures as high as 300°F.

Thermoplastic Cables (937)

Synthinol thermoplastic wires and cables are covered in an eight-page bulletin prepared by Rome Cable Corp. Applications include building wires, portable cords, machine tool and control wire, radio wires and control cables. This wire is supplied in colors.

Maintenance Handbook (938)

A handbook published by Westinghouse deals with maintenance of electronic equipment. Covered in the 6 3/4 x 3 7/8-in. booklet are six basic operations, cleaning, inspecting, feeling, tightening, adjusting and lubricating. Safety precautions for these operations also are treated.

Midget Relays (939)

Ward Leonard has prepared data on its Bulletin 104 midget metal base relays for use in small radio transmitters, aircraft control circuits and other applications where space is limited.

Coaxial Cables (940)

Andrew Co. has released a bulletin covering its line of coaxial cables and cable accessories.

Capacitors (941)

Cornell-Dubilier has issued a revised capacitor catalogue, No. 195A. This 24-page publication gives specifications on all C-D electrolytic paper and mica capacitors as well as capacitor test instruments and Quietone interference filters. Illustrated.

Pyrometers (942)

Wheelco's line of portable pyrometers is described in a folder recently released by that company.

Proximity Fuse (943)

In a 12-page bulletin, Cornell-Dubilier tells its part in development of the proximity fuse.

ELECTRICAL WEST, 68 Post St., San Francisco 4, California
Please send me information about following CIRCLED items:

900	901	902	903	904	905	906	907	908	909	910
911	912	913	914	915	916	917	918	919	920	921
922	923	924	925	926	927	929	929	930	931	932
933	934	935	936	937	938	939	940	941	942	943

Name . . . . . Company* . . . . . Title* . . . . .

Address . . . . . .

* Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

Because of the basic importance of adequate wiring to the entire electrical industry, Anaconda is presenting messages like this in a wide list of national publications

Wire ahead for Full Production

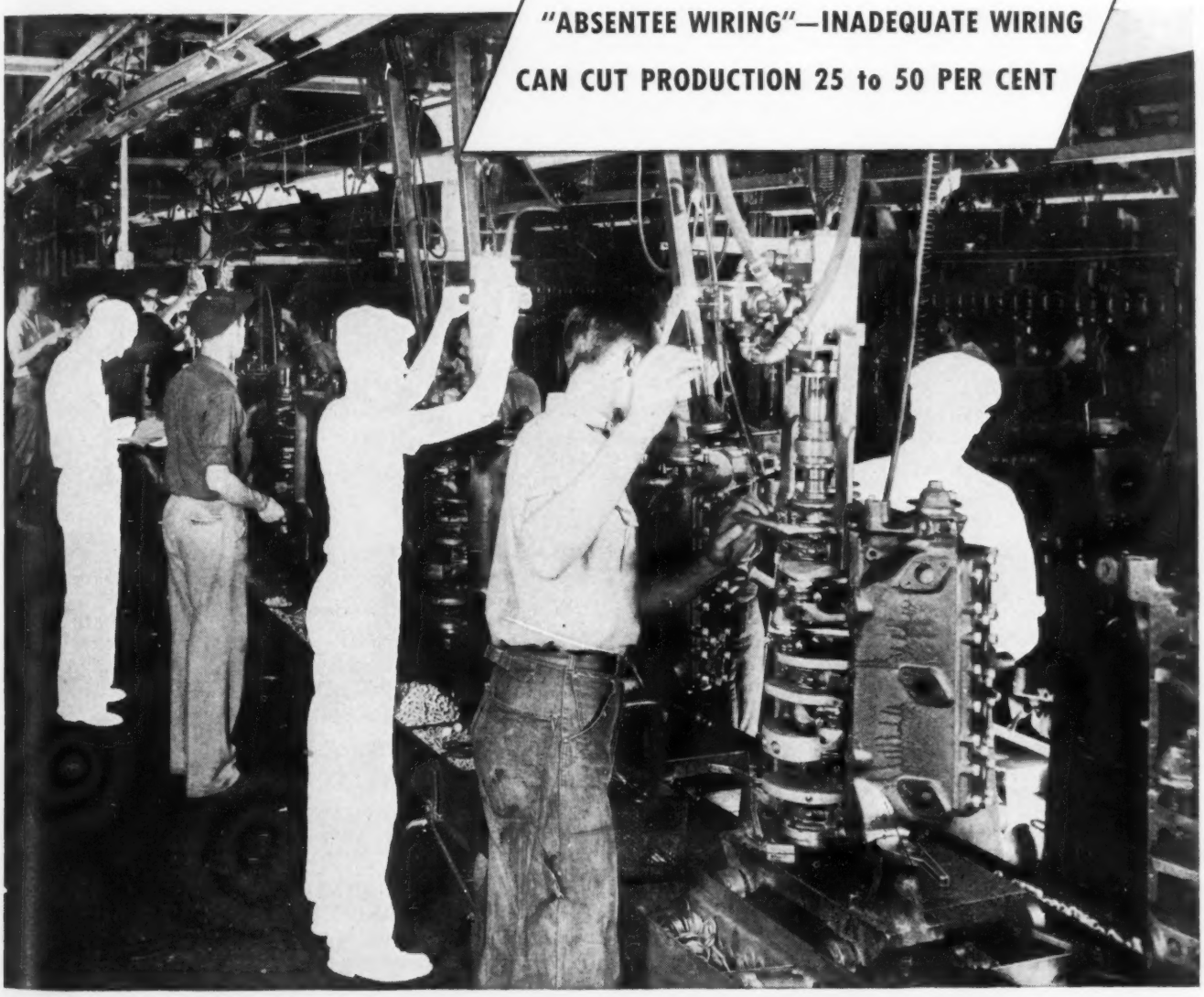
A FULL CREW, on full pay *ought* to mean full production. But the most conscientious workers can't maintain schedules on power-starved machines.

And plant surveys show that obsolete, overtaxed wiring can reduce machine and man power efficiency from 25 to 50 per cent.

By all means make certain your wiring will support your production plans. Check the problem with your plant power engineer, your consulting engineer, electrical contractor or power salesman.

Low-cost electric power, all you want of it, is on the other side of the meter. Make sure it gets where it's needed, to safeguard high-priced man power.

"ABSENTEE WIRING"—INADEQUATE WIRING CAN CUT PRODUCTION 25 to 50 PER CENT



ANACONDA WIRE & CABLE COMPANY

Cole Electric Co.

1510 So. Los Angeles St. Los Angeles (15), Calif.

PRospect 2068

DISCONNECTING SWITCHES

TYPE Y-2

HOOK STICK OPERATED

CLIP END CONTACT
Pressed Copper Shoes
Silver to Silver Contact
Self Aligning
Short Current Path
Individual Stainless Steel Springs
Terminals 1¾" Drilling

HINGE END CONTACT
Silver to Silver
Pressure maintained by Individual Spring Washers
Terminals 1¾" Drilling

BLADES
Hard Drawn Copper
Braced by X Copper Straps
Bearing Yoke at Hinge End
Large Pull-out ring
Leverage pryout

BLADE STOPS
Standard Equipment
Angle can be changed after installation, if necessary

BLADE LOCKS
Standard Equipment

BASES
Hot Dip Galvanized
Drilled to specification

RATINGS
400 to 6000 Amperes
7500 to 161,000 Volts

Power Plant Equipment

AIR BREAK SWITCHES MANUALLY OPERATED
AIR BREAK SWITCHES MOTOR OPERATED
DISCONNECTING SWITCHES
BUS AND CABLE FITTINGS
BUS AND CABLE SUPPORTS
FUSE MOUNTINGS, FUSES
SWITCHBOARDS
INDUCTION RELAYS

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Colman Bldg.
Seattle (4), Washington
Eliot-2722

EARL S. CONDON CO.
357 So. Hill St.
Los Angeles (13), Calif.
MI-2831

THESE tests TELL THE DIFFERENCE in Varnished Insulations

To help you make specific service and cost comparisons ... Irvington will gladly supply generous test samples of any of its varnished insulations.

Each Irvington product will test high in every property, because:

In the manufacture of varnished insulation, Irvington starts right ... with base fabrics made to exacting Irvington standards ... fabrics high in mechanical strength, of uniform thickness and smooth finish. ***Only by using a smooth, uniform base fabric can excessive pimples, thin varnish areas and other "weak spots" be avoided.***

These carefully selected base fabrics are then uniformly coated with Irvington insulating varnishes ... manufactured entirely of tested ingredients ... specific gravity and viscosity controlled for coating fabric. ***Only by using insulating varnishes that are correctly formulated and processed can varnished insulations with full dielectric strength, moisture resistance, heat resistance and long life be secured.***

To assure the best possible insulation values and meet hundreds of different customer specifications, Irvington Varnished Insulations are quality-controlled by over 65 checks. Convince yourself of their outstanding characteristics. Write for samples to make comparative tests.

The red core identifies Irvington insulating cloth and tape.

Look to IRVINGTON for Continued Leadership in Insulation

IRVINGTON
Varnish and Insulator Company
IRVINGTON 11, NEW JERSEY, U. S. A.

PURCHASING DETAILS . .
FULLY GIVEN IN THIS *New* BULLETIN . .

ON OUR ENTIRE MODERN LINE

COMPLETE PRICE LIST
Reliable
POWER-LINE CONNECTORS and CONSTRUCTION SPECIALTIES
COMMUNICATION PROTECTIVE and TERMINAL EQUIPMENT
LIST OF MATERIAL INCLUDED
RELIABLE ELECTRIC COMPANY, CHICAGO 12, ILLINOIS

TO SAVE YOU TIME AND TO SIMPLIFY ORDERING

SEND FOR YOUR *Copy . . .*

Reliable

ELECTRIC COMPANY

3145 CARROLL AVENUE

CHICAGO 12

35 Years Service to the Utilities

BOOKS

you may want

STANDARD REFRIGERATOR TRADE-IN MANUAL & DEALER GUIDE, 1946 Edition, 254 pp., illustrated, Maurice Mann, 503 West 43rd St., New York 18, $5.

This is the first edition since 1941 of the pioneer trade-in guide for electric refrigerators, and should prove exceedingly valuable in the next several months as new refrigerators come back on the market and the value of trade-ins from a resale point of view declines. This book not only carries the most complete listing of all makes of refrigerators manufactured since 1928, but has illustrations by which the dealer can identify the model and its age. This alone is worth a great deal in making accurate appraisals. The tabular matter lists the model number, the cubic-foot capacity, the height and width in inches, the type of finish, the number of trays and the suggested trade-in value as of 1946. These values, according to Edythe Polster, one of its editors, have been calculated carefully on the basis of refrigerators in first-class condition and their resale value, allowing a dealer a reasonable mark-up.

CONDUCTORS and WIRING LAYOUTS, by E. S. Lincoln, 314 pp., 5½x8¼, index, illustrated, Essential Books, Duell, Sloan and Pearce, N. Y., $3.

One of the Modern Electrical Series, this book should be of particular value to electrical estimators, contractors and electrical design engineers. It compiles in one book everything needed about conductors, from their copper characteristics to the various insulations, the cables and cord assemblies, definitions, conductor and cable splicing and connectors, insulating tape, National Electrical Code requirements regarding conductors, numerous tables on conductor sizes and lighting circuit wiring, and passages giving specific recommendations for motor wiring, capacitor wiring, switchboard wiring, welding circuit wiring and signal and communication wiring.

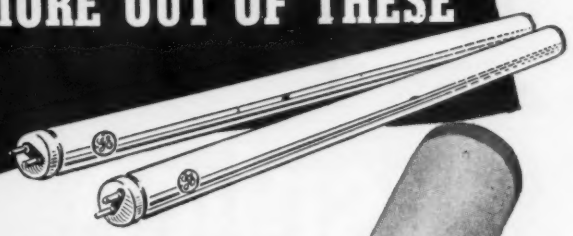
SOUL OF LODESTONE, by Alfred Still, 233 pages, Murray Hill Books, New York, $2.50.

Alfred Still, for 21 years professor of electrical engineering at Purdue University, now makes his home in Seattle. He writes about the profession and industry in which he was long engaged. He was born in England, educated in France, and before coming to America was an electrical designer and manufacturer in his native country. Electrical men will find in this book well documented history, excursions into philosophy, and assorted fascinating episodes as they relate to magnetism and its scientific development. This is a companion piece to his volume of last year, SOUL OF AMBER.

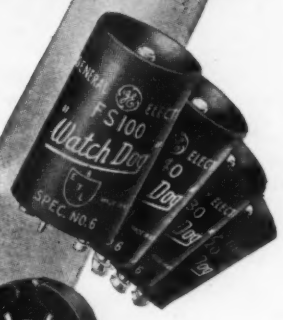
CALIFORNIA YANKEE, by Carol Green Wilson, 184 pages, Saunders Press, Claremont, Calif., $3.75.

The California Yankee is William R. Staats, business pioneer, and his biography forms the motif around which his niece has developed a book which organizes for the first time many significant chapters in southern California history in the period 1867-1928. Recorded in vivid detail is much of the individual pioneering, both in the geographical and the business sense, out of which developed the Edison and the San Joaquin power systems.

TO GET MORE OUT OF THESE



...BACK 'EM UP WITH ALL THESE



WATCH DOG* STARTERS

Here's the starter for fluorescent lamps that eliminates *blink and flicker.* A "cut out" opens the circuit when lamps reach the end of their useful life. Outlasts ordinary starters 5 to 1. Simplifies maintenance and relamping. Types for lamps from 15-to 100-watts.

ROTATING LOCK LAMPHOLDERS

Among G.E.'s full line of lampholders for fluorescent fixtures, this is the most popular type. When lamps are inserted and rotated, they *lock* into place. Made in white or black plastic in mounting combinations to meet the needs of any standard fixture.

TWIN TURRET LAMPHOLDERS

A strong, practical support for two 40-watt lamps and starter. Each lamp is inserted by depressing either face of holder until lamp end snaps into position. Twin Turret Lampholders are easily mounted on any flat surface.

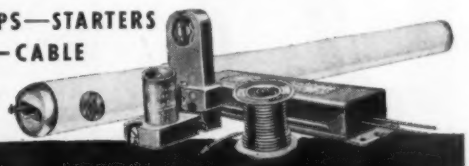
SLIMLINE LAMPHOLDERS

These white plastic lampholders are styled and finished for modern fluorescent fixture lighting with the new Slimline Lamps. Lamps are easily inserted, firmly held. Companion types are particularly suited for narrow channel mounting.

*Trade-mark Reg. U. S. Pat. Off.

For information on these and other G-E accessories for fluorescent lighting (including the new Circline accessories), write Section D21-918, Appliance and Merchandise Dept., General Electric Company, Bridgeport, Conn.

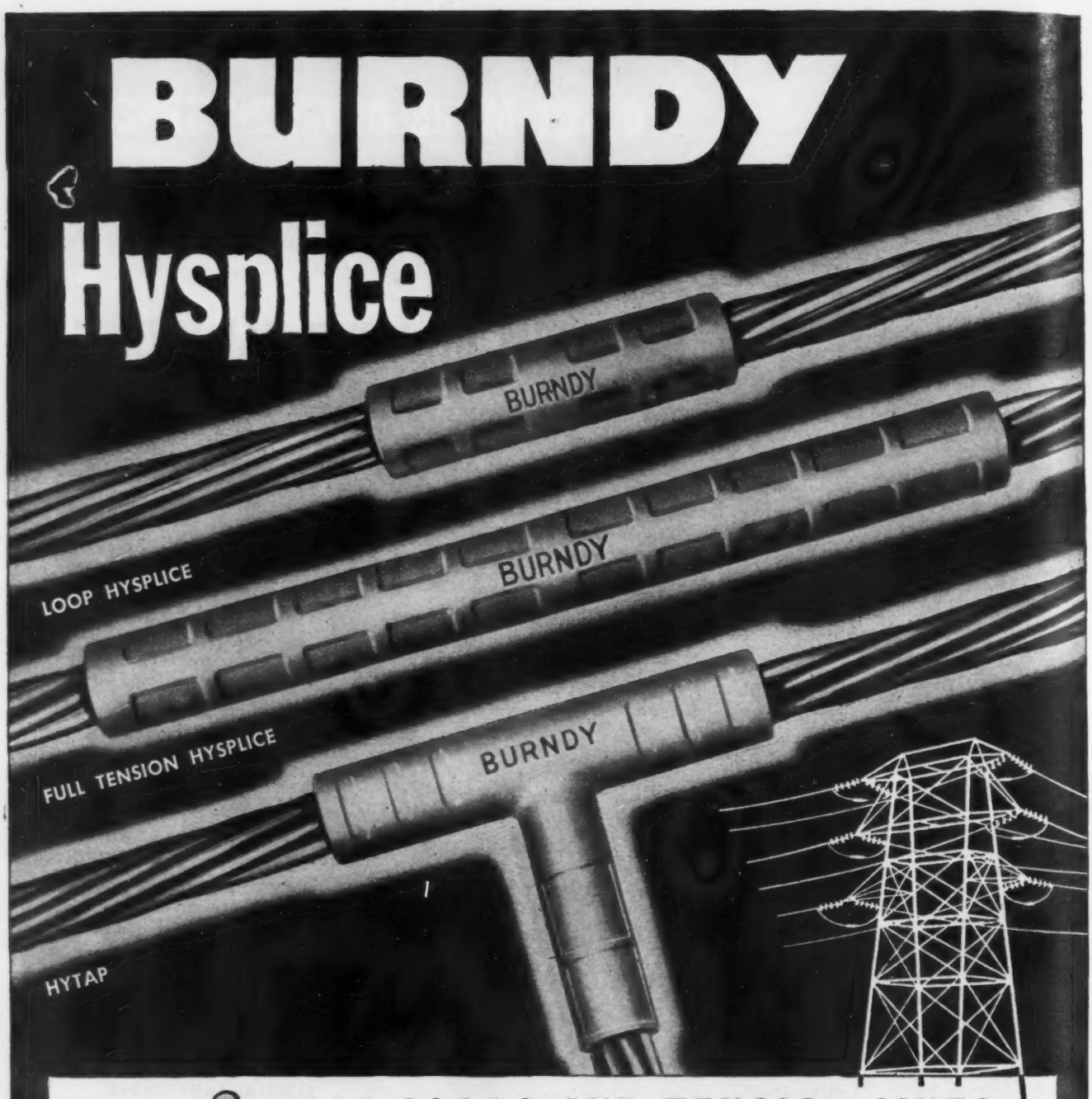
BALLASTS—LAMPS—STARTERS
LAMPHOLDERS—CABLE
for dependability in fluorescent lighting

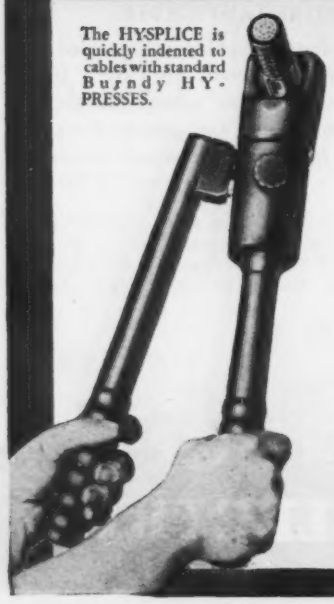


GENERAL ELECTRIC

BURNDY

Hysplice





The HYSPLICE is quickly indented to cables with standard Burndy HY-PRESSES.

FOR LOOPS AND TENSION LINES

The Burndy Hysplice supplies the answer to the problems of loose connections, corrosion, and burn-offs, on high tension and overhead lines.

Available in types for copper and ACSR, the HYSPLICE is readily installed with familiar Burndy portable hydraulic HYPRESSES, with suitable dies. The Burndy method of crimping provides the following advantages:

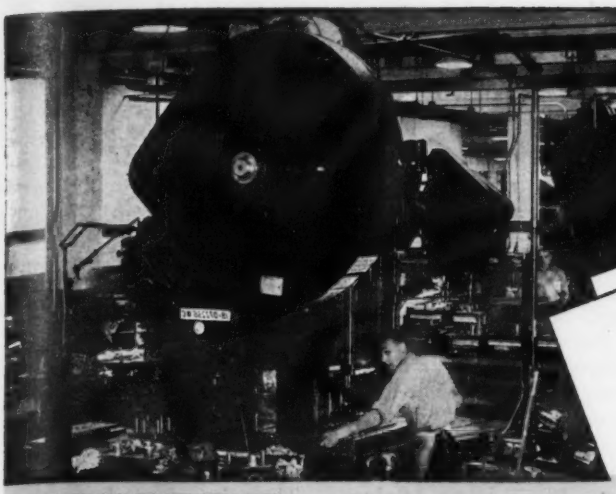
1. **develops the full strength of conductors, where needed.**
2. **provides low resistance connections *even on* oxidized conductors.**
3. **rounded surfaces reduce corona discharge.**

Each Burndy HYSPLICE is filled (sealed ready for use) with a special compound PENETROX "A" for ACSR—PENETROX "C" for copper, which *wipes oxide from conductor surfaces during installation, reducing transverse resistance — permanently seals against corrosion — and, keys connector to conductor for greater mechanical strength!*

Ask your local Burndy representative for details, or write . . .

Burndy Engineering Co., Inc., 107V Bruckner Blvd., N. Y. 54, N. Y.

In Canada: Canadian Line Materials, Ltd., Toronto 13



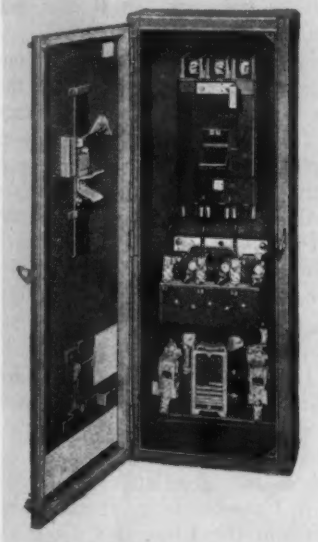
PLANT EFFICIENCY REP

SUBJECT: Installation of Sq D Combinati Starters in Wes Section

SQUARE D
COMBINATION STARTERS SAVE TIME AND SPACE...

Two important operations—switching and starting—brought together in one accessible enclosure. A true factor in attaining peak plant efficiency!

Square D Combination Starters combine Disconnect Switch and Magnetic Starter into a single unit!



SAVES TIME! Being one enclosure, the starter saves you installation time.

SAVES SPACE! It requires considerably less space than individually mounted switches and starters.

INCREASES SAFETY! The starter is interlocked with the disconnect handle, preventing accidental contact with live parts.

RESULTS:

① Time saved

② Space sav

③ Safety d

Provision is also made for padlocking the disconnect when in "off" position.

Square D front-operated starters are available in three capacities—sizes 0, I, and II. Write for Bulletin 8538 for details and illustrations of complete line.

SQUARE D COMPANY

DETROIT MILWAUKEE LOS ANGELES

ELECTRA'S HUSBAND

Atom Cloud on the Horizon

"THE atom bomb tests at Bikini are likely to turn out to be the most misunderstood scientific research project of modern times" one of our guests said recently. There were three of them—all had been observers or reporters of some aspect of Operation Crossroads. This speaker was an engineer.

"Reason for this popular misconception," he continued, "rests with the almost impossible job which fell to the press and radio people. They had to play up the tests as a cross between an Army-Navy football game and the opening night of a great dramatic spectacle. Fact is that the Navy was after information which would enable it to plot scientific curves showing the degree of damage various types of vessels would suffer when subjected to air-dropped and under-water bombs. The Navy hoped to learn what would happen to hulls, superstructures, personnel and materiel from pressure, blast and radiation at given distances from the burst. And they found that out at a price which this nation can afford to pay, just in case the world embarks on an atomic weapons' race."

"With the right degree of popular understanding throughout the world and with a return of the international scientific cooperation, collaboration and competition which accounted for the bomb in the first place, there needn't be an atomic armament race," the scientist in the group said.

"Maybe so, but for my part I'll recommend more and better atomic weapons," the third guest interrupted. He was an aviation expert and had followed closely the aeronautical aspects of the Bikini tests. "After the first bomb was dropped in the Able test I, and everyone else I talked with, was convinced of the necessity of implementing the weapon immediately as our 'big stick' argument for continued peace.

"The morning after the Able blast, standing in the wide-open cargo hatch of a photographic C-54, I was able to study in quick glimpses the effects of what even then was becoming known, with respect for its nightmarish power, as 'That Thing.' Ships which had been sleek and anchored close together in a typical prewar display of 'fat, dumb and happy' were seared and gaunt. We flew at deck level past the gutted *Independence*. She no longer was a 'fat' ship. Her ribs were showing. You could count them between hull plates buckled inward between them by the blast, the air-hammer fist of That Thing. Already the cruiser *Sakawa* was down at the stern, her after-deck split open; and she was to sink half an hour later as we were flying back to Kwajalein. Topsides of other ships were a mess of twisted steel.

"Obviously such a war tool, a bomb exploding in something like one-millioneth of a second, was not for lumbering B-29s and fighter escorts of limited range. Weighing what I saw—evaluating the destructive force of a single bomb thrown against the toughest kind of reinforced steel structures man has ever built—and considering the comments of military experts with whom I talked, I began to feel like a weather forecaster gathering his multitude of facts for a critical typhoon forecast. So at the risk of being ultimately wrong, I'll give you my guess as to the future of military aviation.

"One—you will see the conventional airplane vanish from the military picture in ten years.

"Two—within five years the 10,000-mile, very long-range, very heavy bombers we now are building, and which can be considered no longer as other than 'interim defense air craft,' will be converted to radio control and will launch from outside the perimeter of a target's defenses supersonic flying missiles. These missiles will carry atomic warheads. They will be sent straight to their targets either by an automatic 'homing' mechanism or by control crews sitting in a cloud a hundred miles away.

"Three—ultimately, within five to ten years, our air strength will depend almost entirely upon guided missiles—upon winged remote-controlled atomic missiles which will have built-in 'intelligence' to fly back home, if after being launched, a sudden peace should cancel their terrible mission; and upon long-range supersonic rockets. Both will carry devices which will explode or scatter the contents of their atomic warheads should they be crippled in flight over enemy territory. We will take this precaution against an enemy's salvaging an atomic missile and hurling it back in our faces.

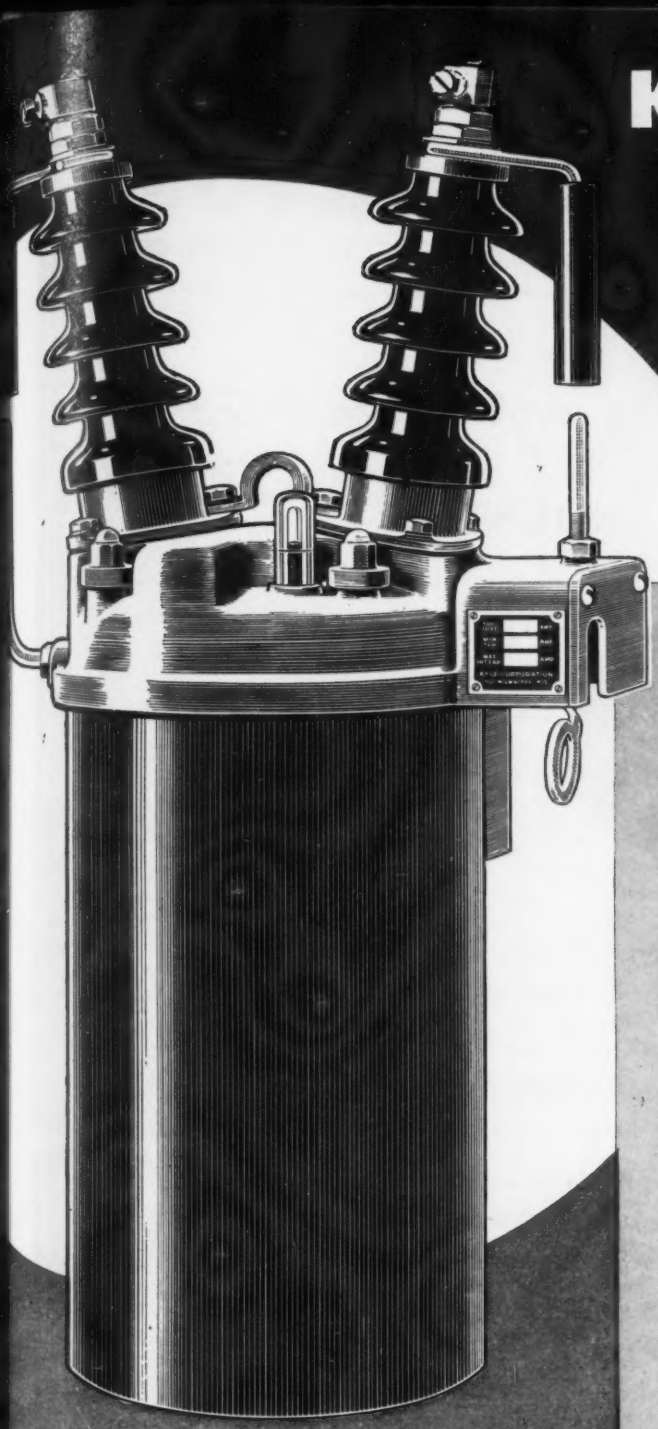
"Four—while we are bending every energy of science and manufacture toward the development of guided missile defenses, there will be an interim period, extending from today to five years hence, in which we will continue our present limited production of conventional and obsolescent piston-engine and jet-powered bombers and fighters. The aircraft industry may expect continuing military orders designed to maintain throughout the nation a nucleus of production capable of instant expansion.

"Five—those who have a direct interest in the production of military aircraft will do themselves and the country a service by building into their equipment a new high order of easy, perfect maintenance. Atomic warfare will not, cannot countenance an 'aborted' bombing mission. A reasonable percentage of accomplished missions will not do. A mission may consist of dropping from one to half a dozen atomic bombs—or missiles—on a small critical target half way round the world. Victory or defeat may well be balanced on the success of a single mission.

"Six—you may expect to see an immediate governmental interest in the fostering of world-wide long-range weather forecasting for the benefit of our air commerce as long as we are at peace; the flight planning of planes and missiles if war comes. Accurate 15-day forecasts for routes to every population and industrial center of the globe are within sight.

"Seventh—there will be immediate re-evaluation—pointed toward the objectives I've just outlined—of United States air forces, a revision of now obsolete or obsolescent concepts of air war tactics and weapons.

"There is one more effect that gives Operation Crossroads a monumental aspect. From the time of Crossroads until we attain international brotherhood, or establish decisive and dictatorial control of the world's handling of nuclear energy, hardly a single person will be able to go through the day without thought of a Bikini atom cloud on the near horizon. Throughout your life and mine there will be a persistent, nagging fear of That Thing. It will come to you every time you see a thunderhead cloud building up into the sky. The trail of a shooting star through the night sky will make you wonder if 'this is it'."

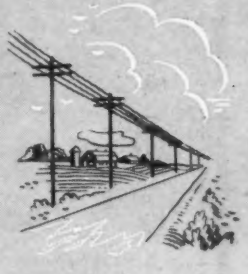


KYLE OIL CIRCUIT RECLOSERS WILL INCREASE YOUR REVENUE

by

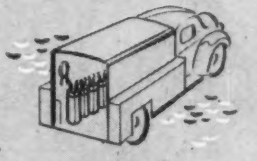
Keeping More of Your Lines in Service

Greater continuity of service on extended rural lines is possible with Kyle Type "H" Oil Circuit Reclosers than is provided by any other economical form of protection. Their use provides instant and automatic clearance of all temporary faults . . . with no interruption in service. Permanent faults are isolated to short branch lines by virtue of the fact that Kyle Reclosers may be coordinated with sectionalizing fuses.



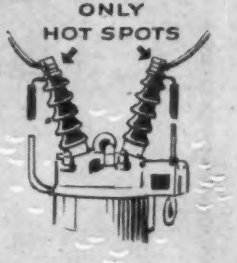
Reducing Maintenance Costs

This automatic elimination of common line faults reduces the number of service trips required. Isolation of branch lines on permanent faults makes for quicker, easier location of line difficulties. Dependable Kyle hydraulic operation . . . without clockwork or motors . . . requires service only at rare intervals. Small, compact, flat-based Kyle Recloser tanks are easily carried in service trucks.



Providing Safe, Trouble-Free Operation

Kyle Reclosers are easy to handle and safe to install and service. Only live parts are the upper terminals on the bushings, providing easy, safe access to the operating handle. This operating handle is trip-free. The Recloser may be manually closed without any danger to the operator. Vibration or jar cannot cause the Recloser to "fall closed" accidentally.



Let your Line Material Representative show you why Kyle Oil Circuit Reclosers are the economical answer to your line protection needs.

Ratings of Kyle Type "H" Oil Circuit Reclosers

Voltage	2400 to 15,000
Ampere Rating	5, 10, 15, 25 or 50
Minimum Tripping Current	10, 20, 30, 50, 100 Amperes
Interrupting Capacity	150, 250, 375, 600, 1200 Amperes

MADE BY KYLE CORPORATION SOUTH MILWAUKEE WISCONSIN

KYLE Circuit Reclosers are Designed and Manufactured for LINE MATERIAL COMPANY MILWAUKEE WISCONSIN

An announcement of importance to the

ELECTRICAL INDUSTRY

COLE Federal NOARK WW

Federal Electric Products Company announces the acquisition of one of America's oldest and best known manufacturers of switchboards and panelboards,

WM. WURDACK ELECTRIC MANUFACTURING COMPANY
St. Louis, Mo.

With the addition of the superb plant facilities, engineering and sales organization of this fifty year old company, Federal takes an important step forward in its expansion program, and places itself in a much improved position to render service to its customers.

In addition to this acquisition, the Cole Electric Products Company, Inc., long affiliated with Federal, and an outstanding manufacturer of custom built electrical apparatus, is also being merged into the greater Federal organization.

Out of this greatly expanded organization comes a new competence unsurpassed in the industry for the rendering of production and engineering service covering every phase of electric light and power distribution.

FEDERAL ELECTRIC PRODUCTS COMPANY

Executive Offices: 50 Paris Street, Newark 5, N. J.

Factories: Newark, N. J., Hartford, Conn., St. Louis, Mo., Long Island City, N. Y.

ELECTRICAL WEST

SEPTEMBER, 1946
VOL. 97 NO. 3

Operation LIGHT

A combined effort is about to begin affecting every Western electrical man and virtually every Westerner

D-MINUS, in wartime, indicated one of those breathless periods before an operation was about to begin. Plans were fixed, equipment was specified, men were being made ready, and there was feverish activity along the lines of supply. Lighting is in the D-minus stage right now.

The lighting operation will consist of furnishing to every category of customer light of such quantity and excellence as would have been considered dream-like only a few years ago. Facts which were on the verge of being brought into cohesive form as the war started—facts about lighting which were the fruit of years of research—these were the beginning of a new conception of what lighting really could do for people, whether they were at work, at home, or in between. Then came the war experience, and particularly the findings of the Illuminating Engineering Society's Light-in-War-Time Committee. That committee found that fine lighting, yes, expensive lighting, paid off without exception, both in terms of more production and of human safety, comfort and freedom from fatigue. These things, plus swift development of technique have brought us to the point where virtually no pre-war lighting installation is adequate in terms of what is now known and what can now be done. The lighting operation will be big.

This swift obsolescence is remarkable for occurring in the field from which the electric power industry got its start. And since light is still synonymous with power to millions of electric users, and a vital part of power to practically every electric user, the operation will have profound effects on electric systems.

Here in the West, famous for consumer acceptance of electric living, and particularly of high-quality lighting, the new standards can be expected to establish a demand which will carry over for years. The existence of the demand is already evident. It is seen in the lighting-load curves of virtually every Western system—curves which, instead of flattening off at war's end, started rising faster than ever before. It is seen in the plans of many systems which anticipate per-customer usages running *two to five times* the present levels.

Since the kind of lighting with which this operation will be concerned is not simply a matter of hanging up more bulbs and tubes, there will be challenging problems to overcome. There will be the obstacle of cost—some say two to ten times the cost of what now are "old-fashioned" jobs. There will be the task of education—made more interesting by the new complexity of the subject and the variety of people concerned. And there will be the creation of the installations themselves.

First-class salesmanship and first-class engineering will be in demand, as well as good judgment on the part of both the direct and indirect participants. In lighting, the interests of all electrical groups, as well as those of architects and consulting engineers, converge. Manufacturers, wholesalers and dealers, utilities and contractors, all participate. This congregation of interests, together with the goals of better human well-being toward which the lighting program will move, may very well be the starting point for a renewed teamwork—that essential element of successful group enterprise which has become so badly battered of late.

Public officials, small business men, plant superintendents, school boards, executives farmers, housewives—every kind of citizen will be listening to the story of modern lighting. It's important that it be told well. The same people will be watching the pilot installations. It's important that they be well built.

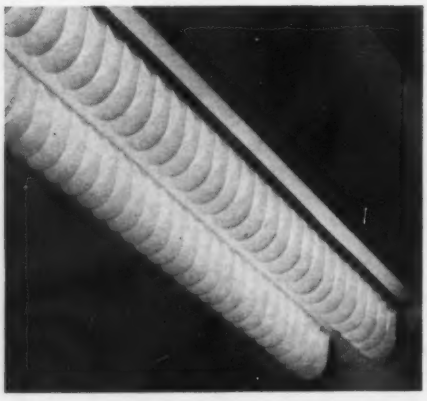
In ELECTRICAL WEST, in other magazines, in the presentations of manufacturers and societies, lighting men are provided with news and know-how, basic data and technique, of a thoroughness and excellence seldom available in any field before. These services will go on.

In this issue, ELECTRICAL WEST turns its attention to those straining lines of supply. For as soon as they get moving the operation will be in full swing. The D-minus phase will be passed. On the following pages is to be found an exhibition of new equipment—a "West Coast Lighting Exposition." The equipment shown is that submitted in response to a request to 230 manufacturers for information about new items, introduced within the past year.

As a service to those concerned with lighting the West, a directory is furnished (page 82) showing where the equipment of the responding manufacturers may be obtained. Also, in ELECTRICAL WEST for April 1946, is a comprehensive directory of electrical manufacturers, broken down by type of product, and with a cross-index to Western outlets. About 20 product headings in the April directory apply to lighting, although without reference to what new equipment the manufacturers are offering in the West right now, which is the basis for the more specialized supplement which follows

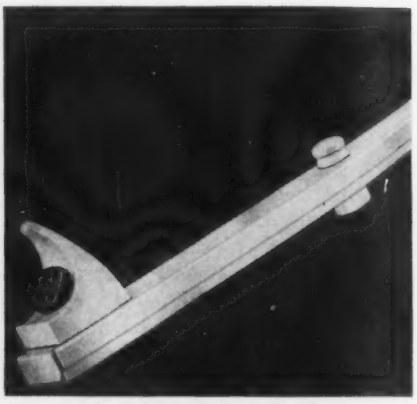
LIGHTING PRODUCT DISPLAY

Equipment which follows is that announced as new within the past year by those of 230 manufacturers who responded to an invitation to participate in this Lighting Exposition. The manufacturer of each item is stated. To find the local outlet for a given product turn to "Where to Buy Lighting in the West," on page 82

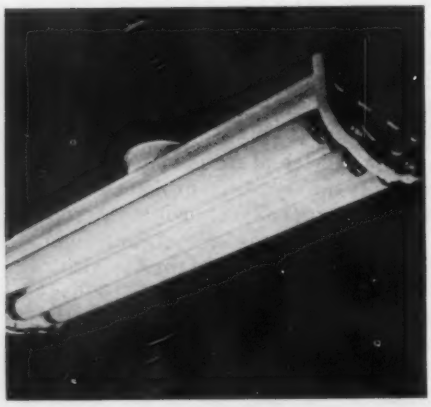


Fluor-O-Shields offer simple means of louvering bare-lamp fluorescent installations. This Camfield product snaps onto 20- and 40-watt lights, is of lightweight aluminum. List, 40-watt, $1.95.

Circline Lampholder for fluorescent units by G-E. Designed particularly as aid to manufacturers. Consists of holder and two spring-loaded supports of clear plastic, with 1/8-in pipe threads.

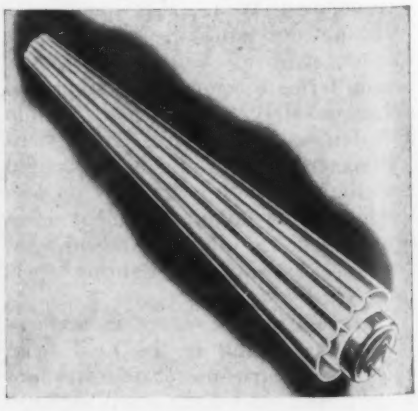


Circline Conventional Mounting is simplified for 12-in. units by G-E holder which provides electrical connections, positions the lamp and supports it at two points; lamp removal is easy.

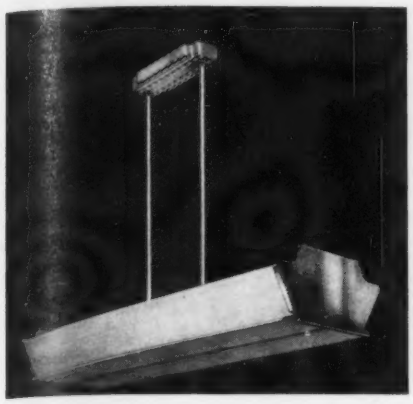


Kitchen Fixtures of 2- or 3-light design by Mastercraft Electric utilize that manufacturer's enameling process, claimed to be crack and chip free and to preserve high reflective factor.

Hydee Hanger is Day-Brite device for easy installation of fluorescent unit where outlet box is already in. It attaches to any 3 1/4- or 4-in. box. Comes with 5-ft. chains, S hooks, cord clips.

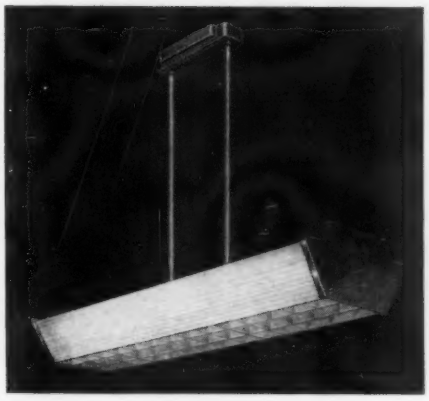


Plastic Diffuser by Guth is designed to snap onto a 4-ft. lamp, thereby reducing surface brightness by 30% and cutting glare. Claimed to be more efficient than glass diffusing panels.



Permaflector Van Buren, one of Pittsburgh Reflector Co.'s "Presidential" series of fluorescent luminaires. Available in 2-, 3- and 4-lamp sizes, 40-watt lamps, for surface or suspension mount.

Luminous Indirect Unit, "Star," by Wakefield Brass, utilizes translucent reflector to keep fixture and ceiling at same brightness. Two 40-watt lamps per section. Bulletin 5-46 tells story.

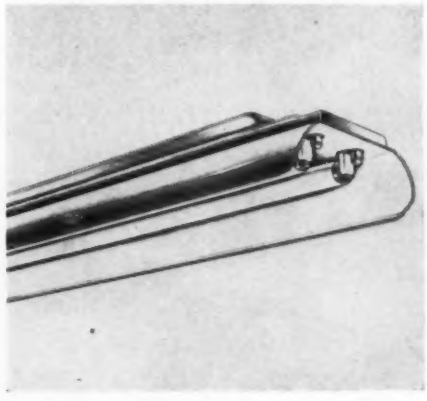


Permaflector Wilson, another model in Pittsburgh Reflectors' Presidential series. Items in series are similar as to construction, finish, etc. Four-lamp size is 48 1/8 x 7 3/4 x 17 7/8 inches.

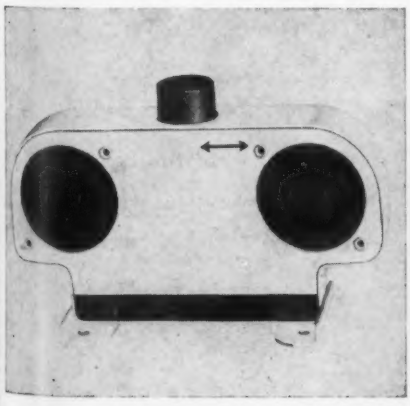
FLUORESCENT

Indicative of prevailing activity in the lighting field is the variety of new equipment for handling fluorescent light. Half the reported new products fall in this category. While this is biased to some extent by the fact that more manufacturers are confining themselves to this field, with the result that the proportion of announcements may exceed the proportion of total output, it is significant that virtually no new incandescent fixtures are being talked about. Even these fluorescent designs probably represent only a fraction of all units now being developed by all factories.

Commercial Fixture by Day-Brite Lighting for two 40-watt lamps will soon be available in size for two 100-watt. New stem hangars will permit 1-in. vertical adjustment of continuous units.

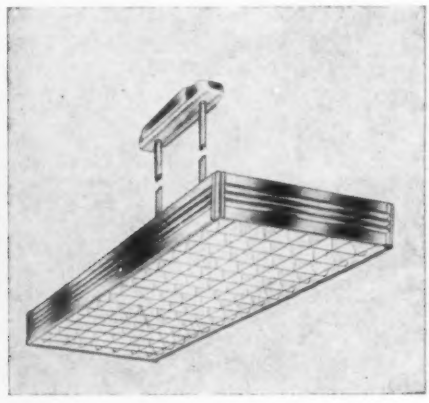


Tur-A-Top Industrial Unit features one-piece stamped steel top housing. Models for 2 or 3 40-watt lamps and 2 100-watt. Accommodates both open and closed end reflectors. By Day-Brite.

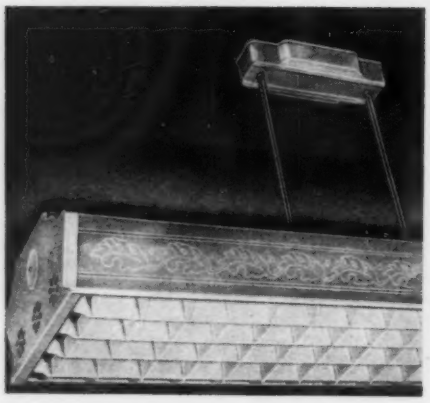


Twin Turret F-Lampholder by G-E for use with 40-watt lamps aims at ruggedness and simplicity. Starters replaceable without disturbing lamps. Designed to prevent falling lamps.

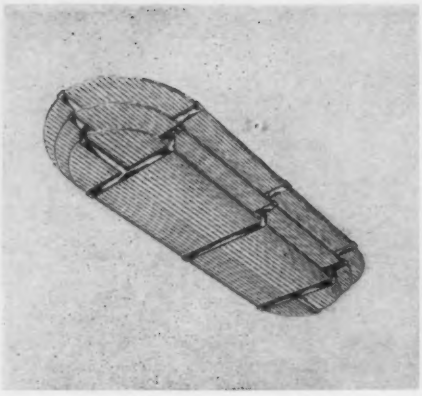
Slimline Lampholder designed by G-E for use in general lighting fixtures. It is a medium, single-pin type for multiple service only; takes T8 and T6 lamps mounted at 2-in. centers min.



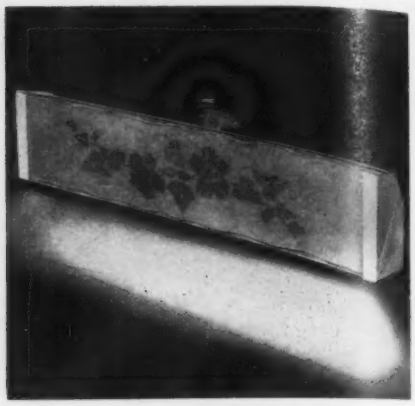
Office Fixture with all-aluminum frame and extruded aluminum trim corners accommodates 4 40-watt lamps, is furnished also for surface mounting by Garden City Plating & Mfg. Co.



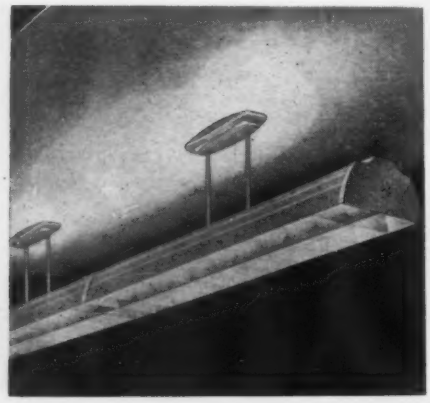
Light Director is Segil unit for 2 to 5 40-watt lamps, flush or pendant mounted. Latter type hangs on polished chrome stems. Utilizes diagonal bottom louvers, with diffusing glass side panels.



For Executive Offices, as well as store and restaurant use, Fluorescent Fixtures of Calif. has introduced the Briqadier fixture, utilizing 3 layers of diffusing glass in 4- or 6-light size (20 or 40 w.).



La Boudoir has French look as well as name. A 2-light 20-watt glass enclosed unit which mounts flush to ceiling or with 4-in. adapter or fitter. Decorative pattern is in 3 colors. Design by Segil.

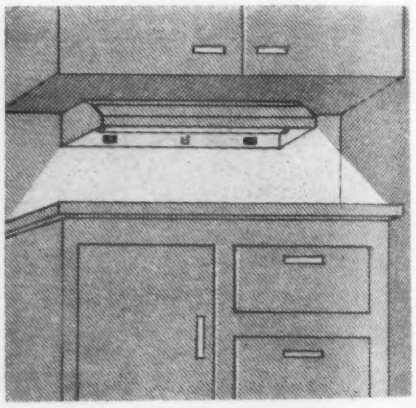


Curtis Forty-Sixty, designed especially for drafting rooms, class rooms, etc., passes 40% of light up for ceiling illumination, hence name. Two 40-watts go in without removing louver; stays clean.

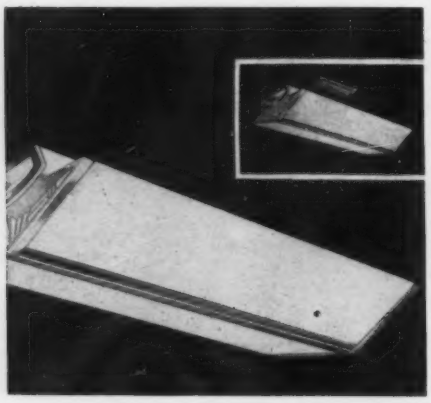
Bathroom Cabinet with four in-built 20-watt F-lights is available from Kahn Mfg. Mirror door is flanked by Skytex glass panels. Sold complete for recessing between studs, 24 1/4-in. high wall opening.

Shelf-O-Lite is a 20-watt plug-in unit comprising a shelf with F-light concealed beneath to be hung above range, desk, bed, etc. Choice of wood finishes. Product of Kahn Mfg., lists as $14.10.

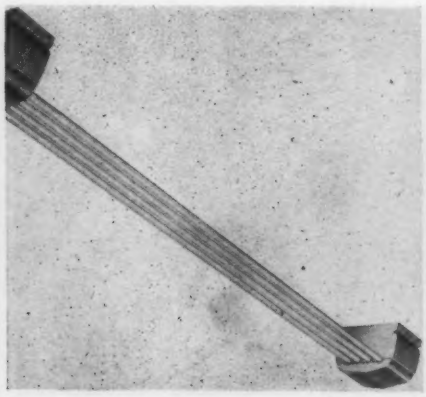
Unite-A-Lite is Moe-Bridges system for plugging together single-light fluorescent strips in 24-, 48- or 96-in. multiples. Five types of shields and reflectors fit onto standard base unit.



Under-Cabinet Unit by Art Metal Co. is for lighting home work areas. Takes single 24-in. lamp, has toggle switch, 4-ft. plug cord, two convenience outlets for handling 300 watts total.

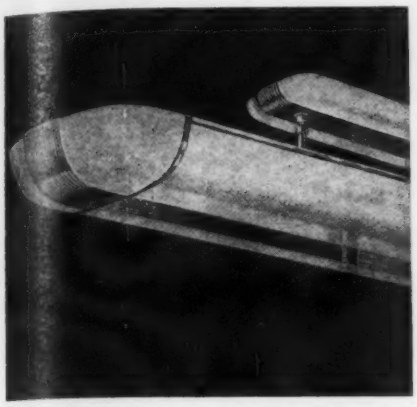


Shielded 4-Light Unit is a Mitchell product for surface or suspension mounting. Steel construction with satin aluminum end plates; prismatic ribbed glass panels. Also comes as a 2-light.

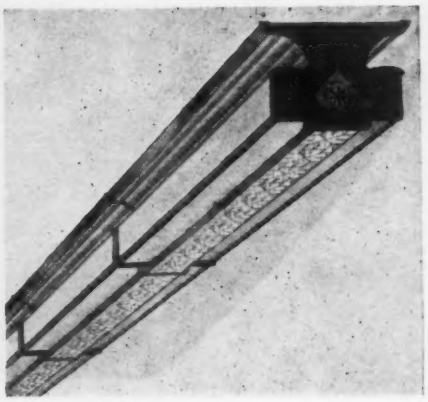


Simplicity is General Luminescent Corp. name for cold-cathode lampholders which are 4-lamp assemblies in intermediate or end types. They are for 8-foot lamps.

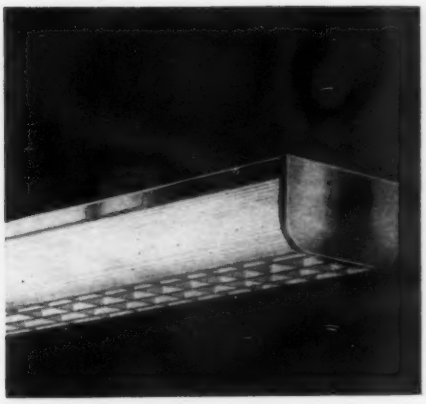
Bright Kitchens are obtainable with double fixture installations. Here are two Leader Model GL 240's, each a twin 40-watt unit, set flush to ceiling. Modified louver keeps out insects, dust.



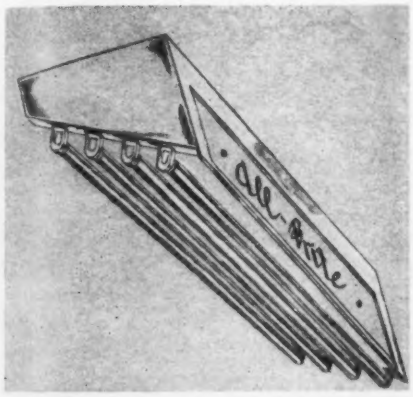
Vinylite Panels are used in the sides of this streamlined Moe-Bridges fixture, supplied with 3½- or 18-in. stems. Two sizes, both 4-light, are offered, one for 20-, one for 40-watt lamps.



Elegance Standardized from a custom-built design in Curtis No. 70610-XE. 4-lamp unit available singly or in continuous runs. Made of steel and crystal glass; panels lightly sanded; satin finish.

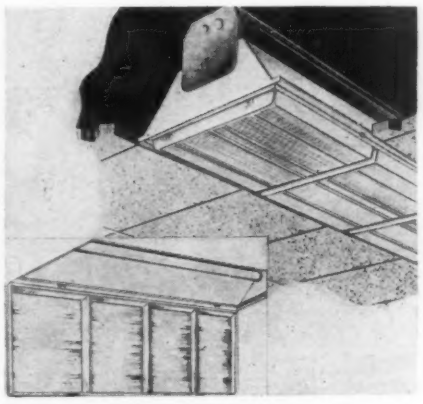


Permaflector Tyler by Pittsburgh Reflector Co. has die-formed, all-metal parts, with exterior metallic finish. Tyler features curved satin glass side panels, egg-crate lovered bottom.



Duo-Windowlight directs light of four 40-watt F tubes on window display and at same time provides outdoor-visible sign from same light source. Fluorescent Fixtures of Calif. (Pat. App. for).

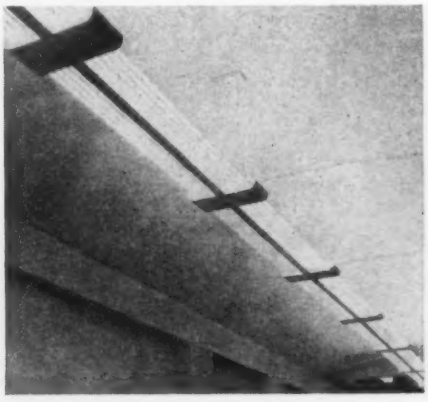
Panelite is an articulated system for producing either continuous strip fluorescent, or continuous strip with both fluorescent and down light. System consists of intermediate section, for two 40-watt lamps, ceiling mount, glass panels bottom and sides, and an intensifier section of matching design for 100-watt light, using 6-in. square prismatic lens. The F-sections may be run continuously or with intensifiers between. Panelite is a product of Art Metal Co.



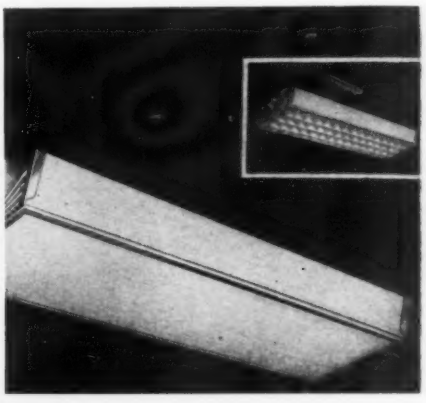
Recessed Units and semi-recessed in new designs for 2, 3 or 4 48-in. lamps, lacquered in any color, have been added to Litekraft line of C. W. Cole & Co.

Ceilings Unlimited is name of Miller troffer lighting system with patented ceiling furring hanger to reduce number of supports. Permits units, blocks, patterns or strips in any type ceiling.

Light by Trolley injects flexibility into many industrial applications, especially where frequent shifts in demand occur. Trol-E-Duct by BullDog Electric combines feeder and fixture support.

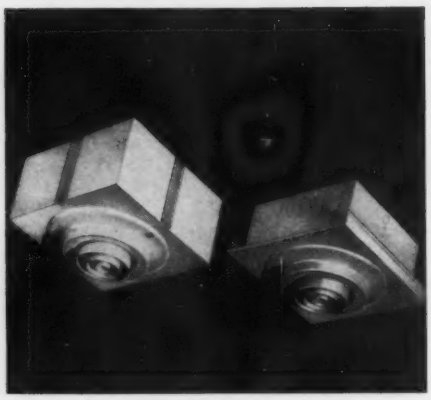


Cold Cathode Suspension installations are accomplished with General Luminescent Corp's "Airliner" units. End assembly and an intermediate assembly for 8-lamp groups in 8-ft. multiples.

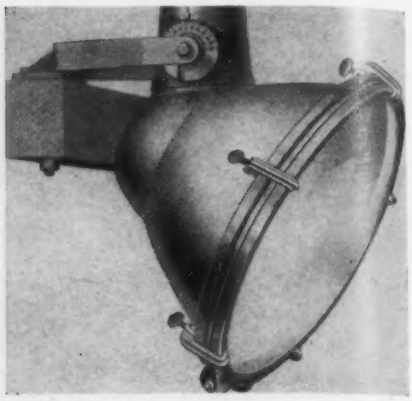


Mitchell Deluxe line of 48-in. units for continuous surface rows or individual suspension are in 2- or 4-light size with ribbed glass or louvered bottom (inset); available with instant start.

Contact Light for airport runways has been designed by Westinghouse to carry loads imposed by new, heavy airplanes. Diam. is 1 ft., stands 2¾ in. above ground, supports 50-ton load.



Hy-Liters are Guth product for spot or flood effects, particularly on merchandise. Utilize 150-watt lamps; louvers tilt and turn to direct light anywhere in 90° cone.



Champion is Revere's dust-tight, waterproof floodlight for railroad yard, sports and similar applications. Mogul socket takes 750- to 1,500-watt lamps. Rotation feature simplifies servicing.

INCANDESCENT

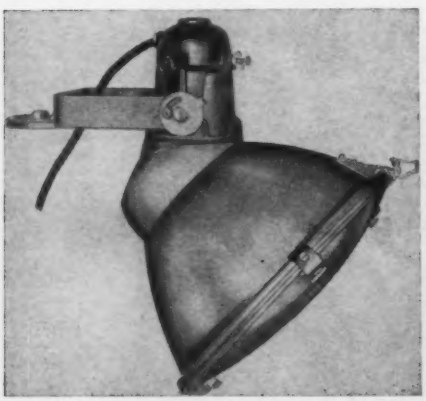
Confined Floodlighting to prevent spillover on adjacent property has special value in service station and similar locations. Revere light-weight triangular unit provides sharp cut-off.

Adjustable Hoods as an easy means of spot lighting interiors have been added to Swivelier line. Choice of arms for 36-in. to flush mounting on outlet box. Adjustable in 90° cone. Also clusters.

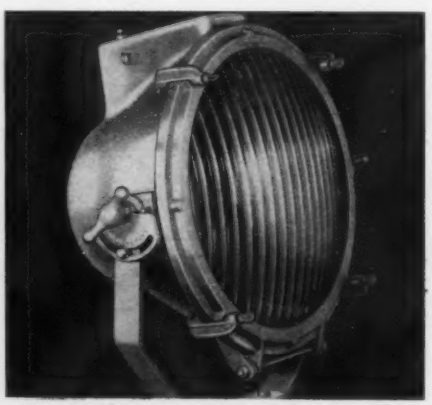
Adjustable Floods (5°steps) in both directions in 750- to 1,500-watt ratings have been added to Steber floodlights.

Theater Lighting of virtually every type is now available from Major Equipment Co.

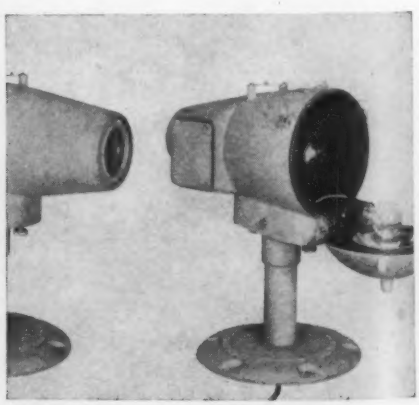
Eliptor Floodlight by Revere now in all-aluminum light-weight model of higher reflective efficiency. Takes 300- to 1,000-watt lamps or 400-watt base burning mercury. Has preset preserver.



Weather-tight Floodlight for sports and recreation areas, service stations, etc. Introduced by Westinghouse as Type VRC-18, it is one of a series of new units for medium outdoor duty.



Red Cap Flood-Lites in No. 2020 series by S&M Lamp Co. are heavy-duty units of 1-piece cast aluminum for 750-, 1,000-, 1,500-w. lamps. Three models, 3 beam widths, supplemental focus.



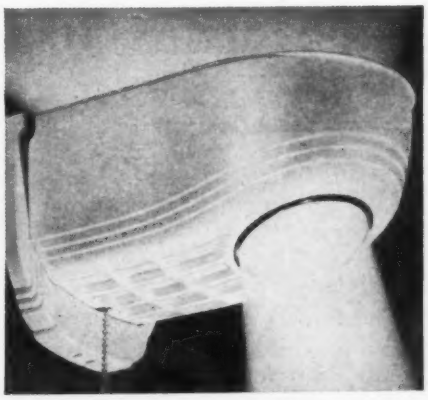
Approach-angle Indicator flashes three sharply divided beams as pilots come in to land. Red is for too low, yellow too high, green OK. Uses 100- or 240-watt lamp; Westinghouse product.

General Purpose floodlighting requirements may be handled with S&M units Nos. 852 & 872, designed to find residential and commercial usefulness; 150, 200, 300 watts; 10-in. diameter.

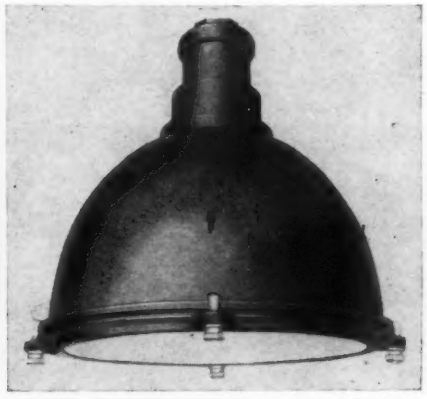
Yankee Stadium Light is designed to minimize installation, maintenance costs. Has blade sight for adjusting coverage, stop for returning to adjusted position; easy cleaning. G-E.

Oval Street-Light Unit for small lamps gets sharp cut-off by keeping filament above reflector edge; uses 1,000- or 2,500-lumen, 5⅜-in. light-center lamps; product of Westinghouse, OV 18.

Heavy-duty Floodlights of cast aluminum with Alzak reflectors are designed by Westinghouse for applications where high light output is required, as railroad yards, industrial projects, etc.



Lens-Ray by Mitchell, primarily for over-mirror mounting, combines focussed beam with general upward and louvered downward light. Takes 100-watt lamp, includes outlet, lists at $6.50.

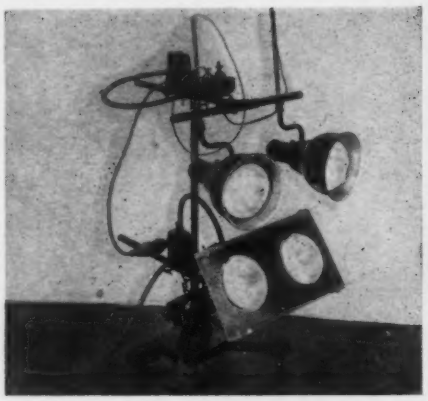


Millite Luminaires are dust-tight, vapor-tight Westinghouse units for heavy-duty service in high-bay areas, indoors or outdoors, wherever fumes, dust, smoke or moisture are excessive.

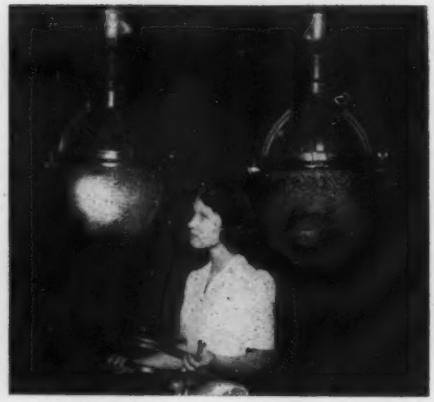
Low-Cost Lampholder added to Moe Bros. line of lamps and fixtures has built-in turntable plate mounting a folding spring clip, thus permitting a 360° traverse.

Streamlined Oval street-lighting unit by Westinghouse is OV 20. Aimed at improved appearance and optics, with more light on street and less glare; will take incandescent or mercury lamp.

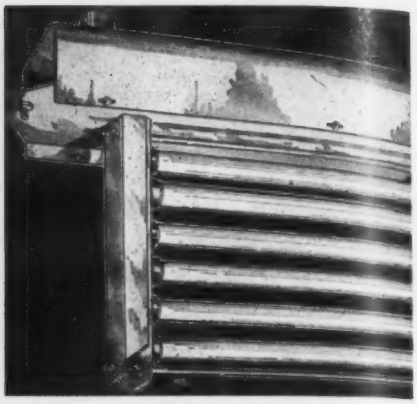
Medium-Size Recreational areas are most suitable to S&M additions to 1600 series floodlights. Incorporate spun aluminum reflectors, Alzak finish, heat, shock resisting lens; 750-1,500 w.



Mobile Heat is achieved with Wuelker units. Illustrated model combines adjustable flexodome reflectors with channel heat units. Other models range up to 24 (or more) lamps.



Pressed Globe (left) No. 232 improves on old type (right), fits Form 81 and 101 holders. Annealed, it has longer expected life than blown globes. Also fits holder shown for Form 79. G-E.



In-Duct Radiation is provided by Art Metal's multiple-lamp ultraviolet unit. For installation in round or rectangular ducts, singly or in battery. Permits easy lamp withdrawal, continued use.

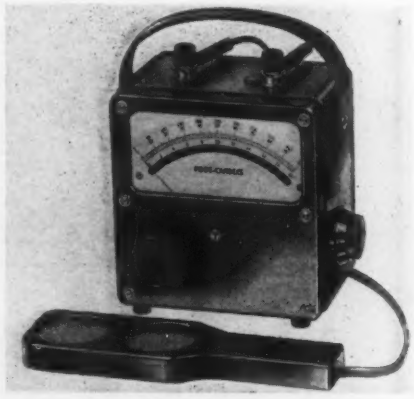
Ballast for 2-lamp 40-watt units by Chicago Transformer is same internally but has redesigned case which is streamlined and smaller, while retaining same standard dimensions for mounting.

MISCELLANEOUS

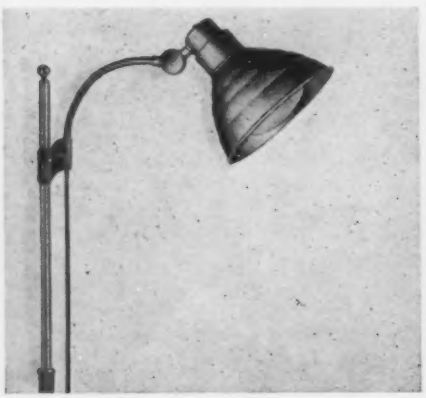
Luminous House Numbers with black Bakelite numbers mounted on porcelain plate are now listed at $4.95, with bulb operating off door-bell circuit by Hatheway. Has stainless steel faceband.

Lucite Numbers for houses by Belmont consist of framed lucite plate with numbers illuminated against black.

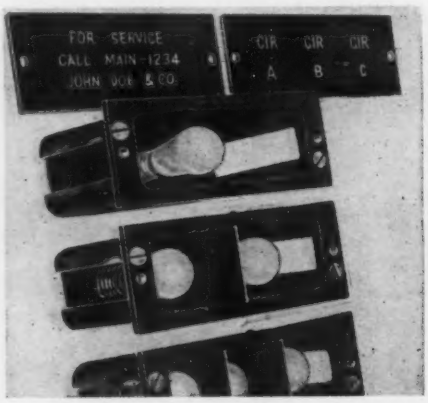
Black-Light equipment and materials are available from Keese Engineering Co.



Wide-Range Measuring of high accuracy is purpose of Weston Model 756 Illumination meter. No color correction required; for research or as master meter; 0-20/50/500 scale is standard.

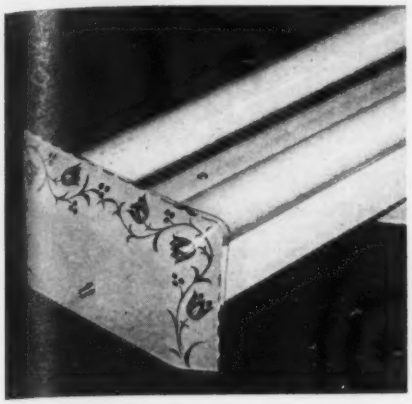


Sun Lamp to accommodate the 275-watt Mazda RS Sunlight lamp is listed by Mitchell at $33.25, including lamp, 12-ft. cord. Adjusts in any direction and at heights from 30 in. to 5 ft.

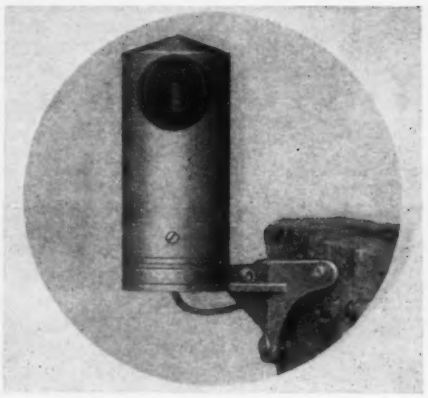


Annunciator Systems may be built up in blocks with Kirkland ML units. Basic lampholder is 3¾ x 1½ in., takes one to four S6 lamps, has slots for light barriers; various faceplates available.

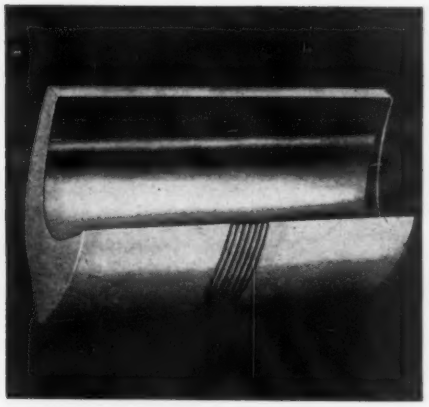
Spot Heat (or light) can be handled with this Wuelker unit. Other models in "Baby White Kitten" line are adapted to numerous applications in industrial heating and theatrical lighting.



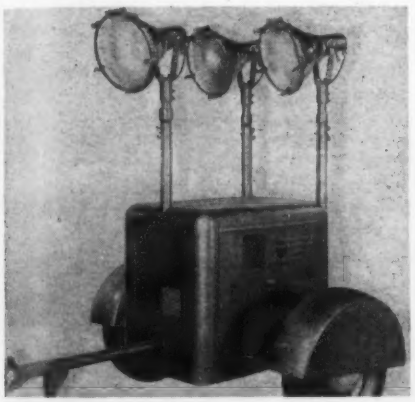
Bent Glass Ends by Bent Glass Works Inc. Bowls and panels in "Hi-Fire Ceramic" designs, available in plain, satin-acid finish white or pink or with decoration. Stock patterns and designs.



Sunswitch control for street lights or single unit. Has compact, rugged construction; designed for accuracy and long life. Includes time-delay, fail-safe and non-cycling. Ripley product.



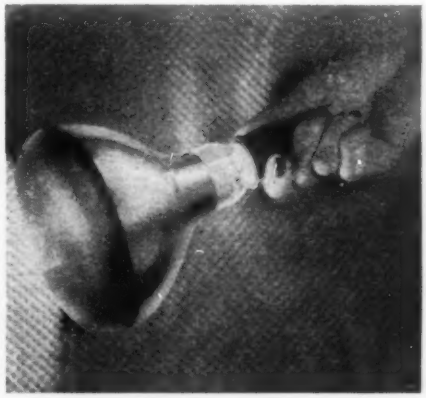
Rad-i-Air is name for Mitchell germicidal line. Unit shown for wall mount, in sizes for 15- or 30-watt lamps. Another model (No. 981) is offered with baffles adjustable over wide angle.



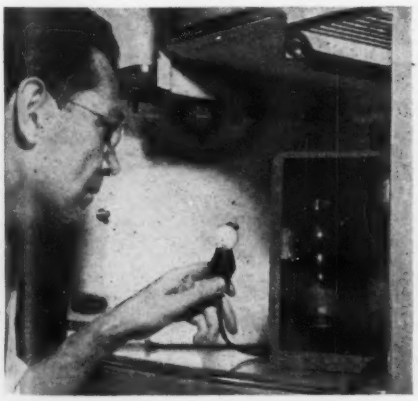
Emergency Light for fires, wrecks, night work on remote projects can be obtained from Revere's mobile gas-engine unit. It is air-cooled, push-button starting, will operate total of 3,000 w.

LAMPS

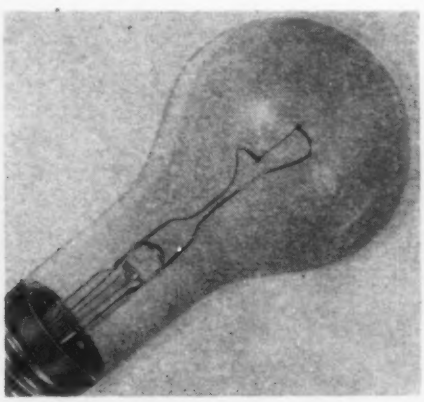
Scarcity of announcements of new light sources in answer to a query to manufacturers, evident herein, is primarily a tribute to the advanced state of the art. This points up the fact that the problem in a given lighting job rarely arises from inability to find a suitable light source, but from complexities of handling the light once it is produced. This does not mean that lamp making is a static business, but rather that constant improvement has become standard. Constantly increasing efficiencies are accepted. Spectacular developments may lie ahead. But momentarily the problem is manipulating, not generating, light.



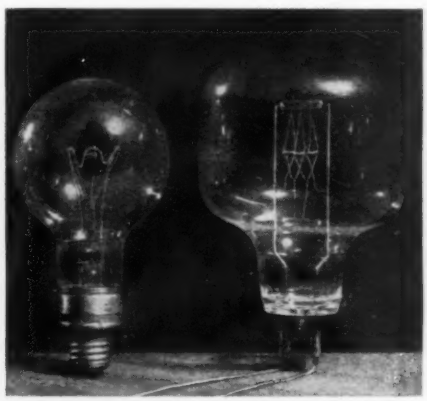
Self-reflecting Heat Lamp is designed by G-E primarily for therapeutic home use. Has hard glass bulb, ruby-hued filter, built-in reflector, medium base; size is 250 watts, list price $2.95.



Midget Sterilamp by Westinghouse is designed to make food last longer in home refrigerators by killing bacteria and producing ozone which "sweetens" air. It uses 3.5 watts, has one-year life.



More Light from existing street luminaires was the objective of Sylvania research leading to the PS-25 lamp, rated 2,500 lumens, 6.6 amp., output previously associated with bigger bulb.



Infrared Industrial Lamps for relatively high heat output. The 250- and 375-watt (left) are interchangeable, are especially for use in open reflector ovens; bigger lamp is 500-watt; both by G-E.

WHERE TO BUY LIGHTING IN THE WEST

LISTED BELOW are manufacturers who responded to an invitation by Electrical West to participate in the preceding Lighting Exposition for Westerners by reporting on new products introduced within the past year. It indicates in a general way the extent of manufacturers actively interested in the Western market with new products available. Every manufacturer is privileged to be included without charge. While the list is, to the extent of the response to the inquiry, as accurate and complete as the publishers could make it, Electrical West assumes no responsibility for errors or omissions.

Advance Transformer Co., 1122 W. Catalpa Ave., Chicago 40, Ill.

Art Metal Co., The, 1814 E. 40th St., Cleveland 3, Ohio—Representatives: Wm. H. Fuller Jr., Long Beach; W. G. Gordon, Seattle. Distributors: G-E Supply, Graybar, Westinghouse Supply, and independent wholesalers in principal cities.

Austin Company, The M. B., 116 S. Desplaines St., Chicago, Ill.—Hauck & Bishop, San Francisco; J. G. Pomeroy Co., Los Angeles; W. W. Wheat & Son, Seattle; James H. Blinn Co., Denver.

Automatic Electric Mfg. Co., Mankato, Minn.—Ralph B. Clapp, Los Angeles 13; Irving Ballard, San Francisco 11; Jack E. Way, Seattle.

Belmont Products Co., P. O. 276, Belmont, Calif.—Electric Agencies, Seattle; wholesalers in principal California cities.

Benjamin Electric Mfg. Co., Des Plaines, Ill.—Branch offices San Francisco, Los Angeles, Seattle, Salt Lake City. Sold only through electrical wholesalers.

Bent Glass Works Inc., 126th St. and Hillside Ave., Richmond Hill 18, N. Y.

BullDog Electric Products Co., Box 177, Detroit 32, Mich.—Coast Electric & Mfg. Co., Portland 12; Safety Switchboard Co., San Francisco 3; Mullenbach Electrical Mfg. Co., Los Angeles 11.

Camfield Mfg. Co., Grand Haven, Mich.—D. E. Sanford Co., Los Angeles, San Francisco and Seattle.

Certified Ballasts Mfgrs., 2116 Keith Bldg., Cleveland, Ohio.

Chicago Transformer Div., Essex Wire Corp., 3501 Addison St., Chicago 18, Ill.—Representatives: W. D. Barnes, San Francisco; J. W. Stewart, Los Angeles. Distributors: California Electric Supply, Lavenson & Savasta, and San Francisco Lighting & Supply, San Francisco; Austin Bros., Stockton; Electric Corp. of California, Los Angeles; Seattle Lighting Fixture Co., Seattle; United Electric Supply, Salt Lake City.

Cole & Co. Inc., C. W., Los Angeles 15, Calif.—R. S. Prussia, San Francisco; RA-O-LITE CO. Ltd., Honolulu.

Crouse-Hinds Co., Syracuse 1, N. Y.—Branch offices in San Francisco, Los Angeles and Seattle.

Curtis Lighting Inc., 6135 W. 65th St., Chicago, Ill.—Representatives: John D. Erikson, San Francisco; Harvey M. Olmstead, Denver; W. K. Turner, Seattle. Distributors: Wholesalers in all principal cities.

Day-Brite Lighting Inc., 5411 Bulwer Ave., St. Louis 7, Mo.—Raymond Ackerman, Salt Lake City; C. S. Belt & Co., Denver; E. B. Bomar, Phoenix; R. M. Camnitz, Portland; K. O. Kershaw, Los Angeles; H. B. Squires Co., San Francisco.

Federal Electric Co. Inc., 8700 S. State St., Chicago, Ill.—F. M. Nicholas Co., San Francisco; J. T. Hill Co., Los Angeles; Northwestern Agencies, Seattle.

Fleur-O-Leur Mfgrs., 2116 E. Keith Bldg., Cleveland, Ohio.

Fluorescent Fixtures of California, 819 Ellis St., San Francisco, Calif.

Fostoria Pressed Steel Corp., The, Fostoria, Ohio—Manufacturers Marketing Service, San Francisco.

Garden City Plating & Mfg. Co., 1420-30 S. Talman Ave., Chicago 8, Ill.—L. C. Brintnall Co., Los Angeles; Kjaer Equipment Co., San Francisco; Kenneth Schumann, Denver; Bryan Burch Co., Seattle.

General Electric Co., Schenectady, N. Y.—R. M. Alvord, Commercial Vice-President, Pacific District, San Francisco; A. S. Moody, Commercial Vice-President, Northwestern District, Portland. Apparatus Dept., Schenectady: A. G. Jones, District Manager, Pacific District; offices at San Francisco, Oakland, Los Angeles, San Diego, Phoenix. J. R. Murphy, District Manager, Northwestern District; offices at Portland, Seattle, Spokane, Tacoma. F. H. Doremus, District Manager, Rocky Mountain District; offices at Denver, Salt Lake City, Butte. Appliance & Merchandise Dept., Bridgeport: B. M. Tassie, District Manager, Pacific District; offices at San Francisco, Los Angeles, Seattle, Salt Lake City. Lamp Dept., Cleveland: M. C. Hixson, Manager, Pacific Sales District, Oakland. E. P. Markee, Manager, South Pacific Sales District; offices at Los Angeles, San Diego. L. R. Wilson, Manager, North Pacific Sales District, Portland; offices at Seattle, Spokane. G. O. Hodgson, Manager, Rocky Mountain Sales District, Denver; offices at Denver, Salt Lake City.

General Luminescent Corp., 732 Federal St., Chicago 5, Ill.—Northwestern Agencies, Inc., Seattle; A. B. Smedley, Pasadena; P. A. Douden, Denver.

Guth Co., The Edwin F., 2615 Washington Blvd., St. Louis 3, Mo.—L. M. Baxter, Portland; John Allan Ware, San Diego and Los Angeles; Stevens Sales Co., Salt Lake City; M. Baxter, Seattle; Dan Radke, San Francisco; A. J. Nelson, Denver.

Hatheway & Co., 75 Montgomery St., Jersey City 2, N. J.—F. J. Airey Co. Inc., Los Angeles; J. C. Coulson, Phoenix; E. C. Holloway, Denver; R. C. James Jr., Seattle; James J. Noble Co., San Francisco; Northwest Sales Co., Portland.

Holophane Co., Inc., 342 Madison Ave., New York City—Branch offices San Francisco and Los Angeles.

Hubbard and Co., 1250 45th St., Oakland, Calif.

Kahn Mfg. Co. Inc., 2051 N. 19th St., Milwaukee 5, Wis.—Lynn & Chemnitz, San Francisco; Fred Chemnitz, Portland.

Keese Engineering Co., 7354 Santa Monica Blvd., Hollywood, and 411 Brannan St., San Francisco.

Kirkland Co., H. R., Morristown, N. J.

Leader Electric Mfg. Co., 6127 N. Broadway, Chicago 40, Ill.—Branch office Oakland, Calif.; W. W. Wheat & Son, Seattle; H. D. Morton, Los Angeles; R. B. Maycock, Salt Lake City; L. R. Ward, Dallas, Tex.; D. C. McCabe, Great Falls, Mont.; Walter Clinton, Houston, Tex.

Lighting Products Inc., Highland Park, Ill.—General Sales Corp., San Francisco, Los Angeles, Seattle, Portland.

Line Material Co., Milwaukee, Wis.—Paul K. Churchill, Div. Mgr., San Francisco, Los Angeles; W. F. Smith, Div. Mgr., Salt Lake City. Dist. Offices Phoenix, Salt Lake, Denver, Seattle, Spokane, Portland, San Francisco and Los Angeles.

Lloyd Products Co., 69 Gordon Ave., Providence, R. I.—W. M. Sanderlin Co., Seattle; Frank H. Bran Co., San Francisco and Los Angeles; Harvey M. Olmstead, Denver; George E. Anderson Co., Dallas.

Major Equipment Co., 4603-19 Fullerton Ave., Chicago, Ill.—Zinsmeyer Co., Los Angeles; Frank I. DuFrane Co., San Francisco; W. M. Hopkins, Denver; Raymond Ackerman, Salt Lake City.

Mastercraft Electric Co., 181 Bruce St., Newark 3, N. J.

Miller Co., The, Meriden, Conn.—A. T. Bergeron, Pacific Coast Sales Manager, Oakland; R. C. English, Portland; Ben Clarkson, Dallas. Distributed by G-E Supply.

Mitchell Mfg. Co., 2525 Clybourn Ave., Chicago 14, Ill.—Tru-Ad Division, Clyde Allen, Sales Mgr., 1019 Madison Ave., Los Angeles; W. E. Gnadt, Salt Lake City; Joseph C. Platt, Edmonds, Wash.; John Maddox, San Francisco; E. J. Baughman, Alhambra, Calif.

Moe-Bridges Corp., Sheboygan, Wis.—Jas. J. Backer, Seattle; E. R. Palmtag Co., San Francisco and Los Angeles; H. George Sheffler, Phoenix.

Moe Bros., Ft. Atkinson, Wis.—Lightcraft of California and Lighting Equipment Supply, both Los Angeles; California Electric Supply, San Francisco; Central Electric Supply and Graybar, both Denver; Marshall-Wells, Billings and Portland; Falls Supply, Great Falls; Osborne & Kitchen, Reno; Electric Supply, Albuquerque; United Electric Supply, Salt Lake City; Seattle Lighting Fixture, Seattle; Casper Supply, Casper.

North **American Electric Lamp Co.,** 1036 Tyler St., St. Louis 6, Mo.—Frank D. Fagan Co., San Francisco; Fred G. Chemnitz, Portland; Rosse M. Gilson, Los Angeles.

Pass & Seymour, 50 Boyd Ave., Syracuse, N. Y. —J. M. Cavanaugh, Portland; J. G. Pomeroy Co., Los Angeles; George A. Gray Co., San Francisco; Fred E. Staible, Denver.

Pittsburgh Reflector Co., Pittsburgh, Pa.—Lyman D. Morgan, Seattle; Frank E. Hastings, Los Angeles; Raymond Ackerman, Salt Lake City; Paul A. Douden, Denver; F. M. Nicholas, San Francisco.

Railley Corporation, 12910 Taft Rd., Cleveland, Ohio—John H. Maddox, San Francisco; Paul A. Douden, Denver; General Electric Supply Corp., San Francisco, Los Angeles, Seattle, Portland.

Reliance Automatic Lighting Co., 1929 Mead St., Racine, Wis.—Reliance Time Switch Service Co., San Francisco; J. J. Perlmuth, Los Angeles; Harold M. Hudson, Seattle; Ernest L. Wilks, Dallas, Tex.

Revere Electric Mfg. Co., 2949 N. Paulina St., Chicago, Ill.—Shields-Harper; Graybar Electric, all principal cities; G-E Supply, all principal cities; Columbia Electric & Mfg., Spokane; Lang Co., Seattle; North Coast Electric, Seattle.

Ripley Co., The, Torrington, Conn.—Signal Electric Supply Co., San Francisco and Los Angeles.

Royal Electric Co. Inc., 95 Grand Ave., Pawtucket, R. I.—Eckert-Lloyd Corp., San Francisco and Los Angeles; G. S. Spangler, Denver; J. B. McDonald, Dallas, Tex.

S & M Lamp Co., Los Angeles, Calif.—Lester Baxter, Dan Radke, San Francisco; Leonard Honn, Portland; Marion Baxter, Seattle; H. Tanner, Denver; Wm. H. Bracken, Los Angeles; John Allen Ware, San Diego.

L. J. Segil Co., 2500 West North Ave., Chicago, Ill.—James Mundstock, San Francisco; Frank Steiner, Los Angeles; L. S. Reed, Denver; Ben Ellis, Phoenix.

Smoot-Holman Co., 321 N. Eucalyptus, Inglewood, Calif.—Branch offices in San Francisco, Seattle; Fred Zaugg, Portland; J. R. Christensen, Salt Lake City.

Steber Mfg. Co., 2700 Roosevelt Rd., Broadview (Maywood P.O.), Ill.—Garnett Young & Co., San Francisco, Los Angeles and Seattle; The Allen B. Carpenter Co., Denver.

Swivelier Co., 30 Irving Place, New York 3, N. Y.—A. S. Detsch, Portland; W. S. Gordon, Seattle; K. B. Schumann, Denver; A. Shoemaker, San Francisco; Leethem Co., Los Angeles.

Sylvania Electric Products Inc., Salem, Mass. —George R. Sommers, Pacific Coast Sales Mgr., Lighting Div., San Francisco. Dist. offices Seattle, Los Angeles.

John C. Virden Co., 6103 Longfellow Ave., Cleveland, Ohio—Incandescent Supply Co., San Francisco, Los Angeles.

Wakefield Brass Co., The F. W., Vermilion, Ohio—Representatives: H. M. Hudson, Seattle; H. B. Squires Co., San Francisco; Gil Southern, Los Angeles; Stevens Sales Co., Salt Lake City. Distributed in the West by Graybar.

Westinghouse Electric Corp., East Pittsburgh, Pa.—Chas. A. Dostal, Vice-Pres., San Francisco. Branch Offices: Seattle, Portland, Los Angeles, Salt Lake City, Phoenix, Spokane. Electrical Appliance Div., Mansfield; J. J. Moffatt, Pacific Coast Mgr., San Francisco; Branch offices in principal cities. Lighting Div., Cleveland: Chas. A. Dostal, Vice-Pres., San Francisco; Branch offices in Seattle, Spokane, Portland, Los Angeles, Salt Lake City, Phoenix. Lamp Div., Bloomfield: W. H. Thompson, Pacific Coast Mgr., San Francisco; Branch offices in Seattle, Portland, San Francisco, Los Angeles, Salt Lake City.

Weston Elec'l. Instrument Corp., Newark, N.J. —Eicher & Bratt, Seattle; Herman E. Held, San Francisco; E. S. Sievers, Los Angeles; Peterson Co., Denver; J. E. Redmond Co., Phoenix.

Wuelker Infra-Red & Lighting Co., 967 Howard St., San Francisco 9, Calif.

Sylvania Awards

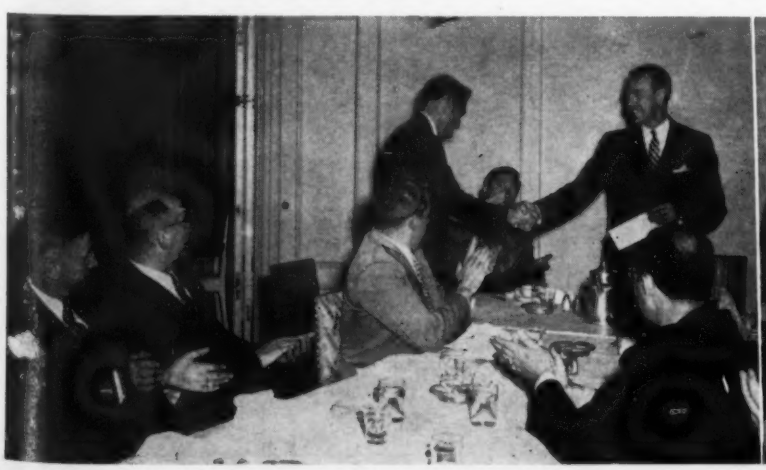
Four Westerners receive honorable mention prizes

Three of the five winners in the West of meritorious awards for commercial fluorescent fixture design in a nationwide contest were presented their prizes at a special dinner in San Francisco by Sylvania Electric Products Corp. George Sommers, Western regional manager for Sylvania, made the presentation to C. M. J. Wood, Pacific Gas and Electric Co., San Francisco division; L. B. Craig and D. R. Keebaugh, same company, East Bay division, Oakland. R. B. Branum, P G and E, Fresno, could not be present to receive his. Ladner V. Ross, Washington Water Power Co., Spokane, was the other Western winner of the $50 meritorious award.

In accepting the awards, each of the winning contestants was asked for comments. Wood, who had been six years with the Frink Corp. as lighting designer, and with P G and E six years, and recently with the Aluminum Co. of America, commented on the difference in the techniques necessary now with the long light sources. The customers are in a position now whereby they must rely more upon expert counsel from either utility engineers or consulting engineers for proper application of the new light sources to the store illumination of the future.

In complimenting the men from his company on their awards, O. R. Doerr, general sales manager, P G and E, emphasized the point that the company never wanted to usurp the field of the architect, designer or consulting engineer. He felt that the utility might well confine its efforts to the promotion of equipment made by the standard manufacturers, and that the architect and engineer be brought into the picture for more intelligent lighting design.

● PUBLICATION of the IES lighting handbook has been postponed to October 1947. Members have been too busy to complete manuscripts for the original target date this year, and postponement is expected particularly to aid manufacturers in completing their reference data section.



C. M. J. Wood receives Sylvania award from George Sommers, Western district manager, at left. At right, "Chick" Field and two other winners, D. R. Keebaugh, L. B. Craig, Oakland

Digest of Electric Code Changes

A supplement to the 1940-1946 cross-index published last month. Index and supplement together form a time-saving guide to getting acquainted with the new code. Listed below by new-code paragraph are those changes which materially affect practice.

James Moore Evans

LAST month, old and new paragraph numbers of the National Electrical Code were tabulated. The 1946 Code contains, however, several paragraphs which are either new or composed of bits and pieces of old paragraphs. Last month's tabulation by itself, therefore, does not provide a complete key to the new code since equivalent paragraphs cannot in every case be easily identified by number.

Some of the changes improve the arrangement of the code but do not affect wiring practice. For instance, par. 6033 was tabulated in the 1940 code but will not be tabulated in the new one, whereas par. 3543 was not in tabular form in the old but is so in the new. In other cases there have been simple rearrangements of sequences, as in par. 4524 (new par. 4543) where subparagraphs (b) and (c) are interchanged.

In order to supplement last month's cross-index with a reference which indicates the ways in which wiring practice will be affected, there is listed below by new code paragraph numbers a summary of what appear to be the more important changes.

Chapter 1—General

ARTICLE 100—Definitions

Askarel
Communication Circuit
Disconnecting Means
Exposed (as applied to live parts)
Exposed (as applied to wiring methods)
Low-energy Power Circuit
Remote Control Circuit
(Note the change in "Setting [of circuit breaker]")
Signal Circuit

Par. No.	New Material
1109	Conductors, of copper
1110	Deteriorating Agencies

Chapter 2—Wiring Design

2006	Exception.
2006(c)	Flexible cords on ungrounded circuits.
2101	"Loads" instead of "outlets."
2102	Reworded; added 5 references.
2103	Branch Circuits, Classifications.
2113	Voltage—subclassifications 1 and 3 are new; restricts portable appliances to 150 volts.
2115(a)	Branch Circuits Required, Lighting and Appliance Circuits subpar. (a) and (c) are new.
2116(a)1	General Lighting, in Listed Occupancies, certain receptacles not considered as adding load.
2121	Specific Requirements—practically all is new.
2122	Overcurrent Protection—new provision.
2123	Outlet Devices—practically all is new.
2124(b)	Receptacles in laundries are to be 3 pole grounded.
2125	No demand factor is permitted on combination branch circuits. In fact, a 15-amp. circuit may carry a rated load of motor operated appliance of only 12 amp.; a 20-amp. circuit, only 16 amp.; a 30-amp. circuit only 24 amp., and a 50-amp. circuit, only 40 amp.
2126	Amplifies sec. 2125 as applied to individual appliances whether motor operated or not.
2127	New Table of Requirements of wire size, fuse size and permissible loads on branch circuits.
2203(a)	Unit loads from table in sec. 2108 and demand factors from sec. 2203 have been consolidated in one table.
2203(c)	Includes receptacle outlets with general lighting in other than dwelling occupancies.
2203(d)	The circuits to ranges have been greatly modified.
2203(e)	This is a new paragraph for "fixed" appliances.
2303(c)	Permits Type T wire in service drops.
2322	Clarifies the requirements for clearance above the ground.
2333	Continues to give additional clearances.
2337	Contains a sentence requiring the service head to be above point for fastening the drops.
2351(d)	Requires a means for disconnecting the wires serving a separate garage or chicken house to be installed in the garage or chicken house.
2358	Connections to terminals. Prohibits solder lugs on service conductors.
2371(c)	Requires overcurrent protection for a separate garage or chicken house.
2389	Provides for switch and fuse protection on primary lines.
2403	There have been several changes in the subparagraphs. The limitations on circuit breakers are new, and provisions for circuit classifications are new.
2404	Thermal devices are permitted as motor protection.
2440	Requires all cartridge fuses to have disconnecting means.
2452	Requires Type S fuses be used.
2481	New provisions for manual operation of circuit breakers.
2554	A new paragraph requiring the grounding electrode to be used for the service neutral and grounded enclosures.
2560	The frames of ranges shall be grounded.
2592	Grounding conductors of No. 8 wire in raceway.
2593	The size of the grounding conductor for d-c systems.

Chapter 3—Wiring Methods

3011	Conductors of different systems may be installed in the same raceway if complying with this paragraph.
3020	Wiring may be installed in ventilating ducts, but special precautions must be taken.
3102	Five new types of insulation are added.
3105	Conductors are permitted in multiple but many changes have been made and new restrictions imposed.

The following corrections apply to last month's cross-index to the Code. The following paragraph in Chapter 2 was omitted, the paragraph in Chapter 9 was incorrectly printed.

Chapter 2—Wiring Design

2409(c) Deleted.

Chapter 9—Construction Specifications

93001(b)-93001(c) incl.....93101(c)-93101(c) 6 incl.

3107	A new paragraph giving the current-carrying capacity of aluminum. This is also repeated as a note following Table 2 as in the 1940 Code.
3362	Eliminates non-metallic sheathed cable as service entrance cable.
3382	Prohibits the use of service cable with bare neutral as circuit wiring to domestic water heaters.
3470	A new table giving the radius of conduit bends.
3489	Uses the table in par. 3470 for bends.
3503	A new paragraph giving the minimum size of flexible conduit.
3543	The covering for underfloor raceway is to be quite different from what it was.
3643	Vertical busways must be especially designed.
3644	Vertical busways extending through floors must be especially supported.
3648 to 3652 incl.	Interim amendment No. 76 was adopted; drastically controls busway installations.
3708	Contains a new provision for finding the size of a box.
Art. 373	A new article separating cabinets and cutout boxes from outlet, switch and junction boxes, but giving little new material.
3814	Contains several new paragraphs on snap switches.
3852	Switchboards must be weatherproof if installed in wet locations.
Art. 390	A new article on wiring prefabricated buildings.

Chapter 4—Equipment for General Use

4003	Contains five new restrictions on flexible cord.
4101	Prohibits live terminals in canopies, fitters and lamp bases.
4103	Exposed accessible terminals prohibited in table and floor lamps.
4111	Corrosion resistive fittings are required in corrosive locations.
4122	Temperature limits required in fixture wiring.
4131	Strength of the screw shell of a lampholder is set at 6 lb.
4132	A fixture of 51 lb. or more weight requires its own support and fluorescent fixtures metal raceway wiring.
4143	A new paragraph requiring attention to current, voltage and temperature of fixture wiring.
4144	Ties in with the temperature limitation of 4143.
4150	A new paragraph on fixtures as raceways.
4161	Practically new and including the ratings of receptacles; 10-amp. type now prohibited.
4162	Floor boxes are not needed in show windows.
4172	Embodies old 4163 and requires a good type of work light.
4173	A name plate or equivalent is required.
4177	High temperature requires a special type of fixture.
4181 to 4187 incl.	New sections for the new types of lighting, 1,000 volts or less.
4188 to 4203 incl.	New sections for the new types of lighting, 1,001 volts or more.
4205	A cross index for arc lamps requirements.
4214	Old par. 4127(c) has been amplified requiring the metal parts of fixtures operating at more than 150 volts to ground (fluorescent fixtures, etc.) to be grounded.
4215	Fixtures, switch plates, etc., near laundry trays are to be grounded.
4237	Infrared lamps are regulated in this new section.
4307	Enclosures for motor controllers, etc., shall not be used as junction boxes, raceways, etc.
4309	The motor tables are to be used instead of actual name-plate ratings.
4310	The future maintenance of motors must be considered at the time of their installation.
4312	The regulation following the table applies to any motor rated 1 hp. or less.
4322	A built in thermal means for giving motor protection is now recognized and for motors rated 1 hp. or less having high impedance, the branch circuit protection is enough.
4325	Automatically started motors must be started with the running protection in the circuit.
4332	This is a long section setting up new regulations for motor protection connected to a circuit supplying lights.
4333	Requires workman protection for motors that automatically restart after a shutdown.
4386, 4387, 4402 & 4409	A starter more than 50 ft. from the motor it controls is considered equivalent to being out of sight.
4424	Fuses are now recognized for branch circuits and feeders of more than 600 volts.
4454	Unbalanced currents must clear a 2-wire d-c generator from a 3-wire circuit.
4512-4515 incl., 4521-4524 incl., 4545 & 4547	New requirements for transformers and transformer vaults covering several pages.
4606-4608 incl.	New requirements for capacitors.

Chapter 5—Special Occupancies

Art. 500	Hazardous Locations. New, fundamental, far-reaching requirements for hazardous locations. It is long, precise and practically all inclusive. The original classification and groups bear little resemblance to the new sections and are mentioned only in the fine print at the beginning of the article.
Art. 510	Garages. Twenty-one new paragraphs have been added. There were 17 paragraphs total in 1940.
5211	The less expensive but safe methods of wiring are permitted in theaters.
5225	Each dimmer must have overcurrent protection.
5307	A switch is required in each "hot" wire terminating in a film vault.
5418	No controls may be in the projection booth except those necessary for operating the booth and remote control switches for auditorium lights and curtain.

Chapter 6—Special Equipment

6008	A long paragraph regulating enclosures for signs, etc.
6031(g)	Insulation on wires in high-voltage signs, etc., shall extend beyond the metal covering. The length varies from 4 in. for 10,000 volts and above to 1½ in. for 5,000 volts and less.
6032(b)	Open core and coil transformers limited to 5,000 volts. Outdoor transformers may be connected as a grounded neutral transformer.
6111(c)	Flexible feeds to cranes and hoists are permitted, preferably with take-up reels or similar.
6112(a)	A new table giving current-carrying capacities for wiring to crane and hoist motors.
6113	Pendant push-button stations must be supported so as to protect the conductors from strain.
6131	Reworded and made much longer with minor changes.
6132	The switch is required to be in the cab or on the bridge.
6204(b)	The temperature ratings are increased, slightly.
6206(c)	The conductors may be 6 ft. long if supported in 3-ft. lengths.
6233	Traveling cables in hazardous locations must be sealed off.
6241(b)	Either the controller or a disconnect switch must be adjacent to and within sight of the elevator machine.
6242	Limit switches are to be mounted in the hoistway and operated by the movement of the car.
Art. 630	Electric Welders. A new article.
6301 to 6334 incl.	All new.
6601	X-ray industrial use or otherwise cannot be used in hazardous locations unless approved for the purpose.
6602	Cables shall be shockproof and 8 ft. above the ground.
6611	Fuses may be required in addition to the circuit breaker.
6615	Foot switches shall return automatically to the "off" position.
6616	Switch must be enclosed or otherwise protected.
6631	Tricky, new, "general" requirements.
Art. 670	Machine Tools. A new article.
6701-6753 incl.	All new.

Chapter 7—Special Conditions

7112	Voltage limitation is now "more than 15,000 volts."
7114	Shielding tape now recognized.
7115	Lead sheath is to "be continued over splices."
7117	A new section giving requirements for shielding rubber insulated conductors.

7118	Shieldings shall be grounded and have stress cones.
7143	Voltage is now increased to "not more than 15,000 volts."
Art. 725	Remote Control, Low Energy Power and Signal Circuits. A new article.
7251 to 7293 incl.	All new sections, very few of which have a familiar ring.
7301	The scope of the article has been added.
7311	Multiple conductor cable may be used.
7312	A common neutral may be employed: (a) On single pole or structure; (b) If not more than 8 branch circuits.
7322(b)	Conductors in circuits of 300 volts or less: (a) Shall be 3 in. or more apart; in open spans, 12 in; (b) Supported every 4½ ft., and (c) Maintained not less than 2 in. from any surface.
7322(c)	Conductors in circuits of 600 volts or more are now regulated.
7322(e)	Line conductors shall have a 12-in. separation except on racks or brackets.
7324(a)	Service drops over steep roofs shall not be closer than 3 ft.
7324(b)	Open conductors shall be not closer than 3 ft. horizontally to windows, etc.
7324(b)4	A discretionary paragraph on service drops.
7351-7354 incl.	New requirements for underground conductors.
7362	Locates lamps below all conductors with some exceptions.

Chapter 8—Communication

8135	Radio lead-ins are to be protected.
8182	Radio noise suppressors are to be of an approved type.

Chapter 9—Construction Specifications

93101(e)	The tables have been changed to accommodate the new types of wire, the use columns have been eliminated and a few other changes made.
94001 to 94002 incl.	New requirements for flexible cords.
94003	A grounding conductor must be colored so as to distinguish it from other conductors.
94104(d)	Fused rosettes are banned.
94104(e)	Non-separable or equivalent rosettes are required.
94105(b)	Built-in fixtures must be 20 gage or heavier as required by a table of gages corresponding to sizes.
94106	New requirements for construction of electric discharge lamps.
94501 & 94502	New requirements for transformers.

Chapter 10—Tables, Diagrams

Tables 1 & 2	The carrying capacities have been changed: 2/0 and above decreased from the interim ruling but are more than the 1940 code. The capacities of conductors with the new insulators have been added.
Table 3	New current-carrying capacities of flexible cords.
Tables 4 & 9	The number of conductors in one conduit or tubing has been changed in many places.
Table 12	A new table for combinations of wire sizes.
Table 18	Embodies a conversion factor to allow for skin effect.
Table 20	The sizes of type R wire for more than 20 amp. have been reduced except for 26, 28, 34, 36, 46, and 48. The sizes of type RH wire have been increased for amperages 13 to 20 incl., 38, and 54 to 60, incl. Two sizes were decreased, 80 and 140. It looks as though previous codes were pretty fair on the fuse sizes and controller settings.
Tables 21 to 24 incl.	In general, they have been changed.
Table 28	Six fundamental changes with illustrations in the diagrams.
Table 29	A new column for 9- to 12-kw. ranges and 4 new notes.
Table 30	A new table giving capacitor ratings.
Table 31	3 new columns added, giving wire sizes, number of conductors and insulation of flexible cords.

Inspectors Object to Modern Range Standards

Harold L. Gerber
Chief Inspector, San Francisco

DUE to the present methods of approval under the existing electric range standards of the Underwriters' Laboratories, the electrical installation and inspection of electric ranges is becoming more complex each day.

There is no standard location on a range for the placing of the name plate. It may be on the front, behind the top of a door, or in many cases, on the inside of the structure, which means that the inspector must remove many of the top elements before the name plate can be found. Nor does the name plate always contain all the information pertinent to installation.

The clearance between the wall and combustible surfaces varies with the type and form of approval of the range. There are specific types of combination coal and electric ranges where the dimensions vary with each range approval. This information is on the approval card but not on the name plate. This means that the inspector must carry a card file or make extra visits to the installation after the information is obtained from his office card file.

Ranges are listed for approval with connecting terminal temperatures up to 90° C. This information is not on the name plate, but is to be placed on a sticker or tag at the terminal connections. When an inspector visits a range installation, the range is usually in place, either against the wall or in a built-in recess in a modern kitchen. This means that the inspector must remove the range from the recess or away from the wall in order to ascertain the correct wiring method.

It was understood that the manufacturers were to supply new ranges with the standard approved types connecting cord and cap, which is to be inserted into the standard wall type range receptacle supplied by the owner. As these cord cap units are of the rubber-covered conductor type, they cannot be used with a range having terminal connection temperatures in excess of 60°C. (New Code for R. C. conductors.) The installation in this case is not practicable. It means that a new type cord with higher temperature ratings must be developed or the conductors will have to be spliced with asbestos covered cords in a terminal box or connected to a receptacle on the rear of the range.

In my opinion, all of this could be eliminated if the following were provided:

1. A standard location common to all ranges for name plate location.
2. The name plate shall contain all information, electrically and physically, pertinent to the installation of the range.
3. Limit the approval of ranges to those having terminal connecting temperatures not in excess of 60°C.

These many conditions are called to the attention of the appliance industry, as electrical inspection and installation under these conditions is not satisfactory (other than to range manufacturers) and results in the loss of many inspection hours that under present conditions could be used on more important inspection work.

Pacific Coast Engineers at Seattle

Housley Terrell

MORE than 325 electrical engineers, with guests who raised the total to just over 500, met Aug. 27-30, in Seattle, for the AIEE's annual Pacific Coast convention. On hand for the curtain-raising session were Institute President J. Elmer Housley of Aluminum Co. of America; Joe Hellenthal, general convention chairman, Puget Sound Power & Light Co.; Mayor William F. Devin of Seattle, and Charles F. Terrell, vice-president of AIEE District No. 9, and vice-president of Puget Sound Power & Light Co.

As Terrell put it, the meeting opened with the firing of one of its big guns, an address by Bruce R. Prentice, who is in charge of coordinating various atomic affairs for General Electric Co. His talk, "Development of Atomic Power," gained timeliness by the fact G-E was about to take over (on Sept. 1) operation of the Hanford Plutonium plant.

Prentice confined himself to power possibilities, particularly at Hanford. G-E's main mission there, he stressed, will be to make Plutonium. How to utilize the power developed as an incident thereto will be a secondary mission. But he emphasized that it is a mission which the entire staff is undertaking with all-out vigor, and with the conviction that the outcome—generation of usable power from atomic source—is a sure thing.

Atomic Power Obstacles

Some of the problems are nevertheless magnificent. He listed them as follows: (1) keeping reaction-stopping materials, called poisons, from getting into a pile; (2) handling heat, on the order of 1,000 hp. per cu.ft.; (3) shielding, at least 5- to 8-ft. thick; (4) safety, both from explosion (which would not be of atomic-bomb order) and from radio activity which affects anything introduced within the pile, including heat transfer fluids.

Feasibility of atomic power, Prentice feels, cannot be stated very precisely because cost of the following are not now known: (1) the fuel itself; (2) the shield; (3) the measures necessary to protect health; (4) "ash" disposal procedures. His estimate of the time sequence in which atomic power will become practicable for public use: (1) ships, (2) remotely located power plants, (3) emergency power plants, (4) public utility, (5) land and air transport.

Where electrical engineering attention is focussed is indicated by the subject headings under which papers were presented: atomic power, central stations, industrial and railroad, aviation, power systems, and communications. Those of the papers which bear directly on the generation and use of power through utility systems are summarized below.

Student Activities

Student electrical engineers had their day, staging a luncheon at which Dean E. W. Schilling, Montana State, presided, and a technical session, run by M. R. Wood, chairman of the student branch at University of Washington. Prof. R. E. Lindblom, University of Washington, was in general charge of student activities at the convention.

Sharp difference of viewpoint in academic circles concerning the organization of student engineers became evident in an unscheduled and informal discussion at the student luncheon. Faculty spokesmen for some of the larger engineering schools were very definite in their feeling that some means of giving the student a broad view of engineering was essential, hence that an organization at the student level embracing all engineering branches was desirable.

In an opening address to the aviation session, Lt. Col. B. R. Kuss outlined a four-point program for "Air Industrial Preparedness Planning." This he gave as: (1) continuous research with limited production for the purpose of bringing designs to volume-production readiness; (2) an industry nucleous with a minimum peacetime production rate of 3,000 planes; (3) a reserve of recoverable industrial plant, permitting volume production in 1½ years instead of 3, as heretofore; (4) continuous joint planning by air corps and industry.

Professional Guidance

A half-day conference was devoted to the pressing question of how the institute can broaden its organization so as to give its members professional guidance in the same effective way it is now giving them technical assistance. The conference discussion indicated that, although this move is already overdue, engineers are, on a local basis, still fumbling their way through the preliminaries.

Hydro Plants

Hydroelectric Power System Design, S. M. Denton, USBR, Denver.

A resume of over-all structural features of assorted USBR plants, including one (proposed and unidentified) with power house situated deep in the low-stress portion of the dam itself.

F. S. Benson, PG and E, in discussion, favored water fire-protection systems (over carbon-dioxide systems described in the paper) on the basis of equal effectiveness at lower cost. He suggested that types of lighting and interior color treatment are an impor-

Schilling Lindblom Wood

tant phase of the subject, PG and E utilizing dimensional schemes to make machines and boards stand out. He also raised the question of whether new wires becoming available may not favor open wire over cable or conduit for control circuits.

Quick Take

An Oscillograph for Recording Transient Recovery Voltages, W. G. Hoover, Stanford University.

Describing an instrument developed (with assistance in construction by Pacific Electric Mfg. Corp.) for fast, accurate measurement of recovery voltages and presenting certain readings taken with the oscillograph at PG and E's Newark substation. A stationary film is utilized, and immediate visual display is also obtained. The presentation consists of a series of horizontal time sweeps, occurring near current zero. Successive sweeps follow at half-cycle intervals each displaced downward on the screen by a constant drift, designed into the machine.

Serving the Farm

Specific Engineering Problems in Rural Electrification and Electro-agriculture, M. M. Samuels, REA, Washington, D. C.

A plea for better rural service, premised on the contention that the individual farm customer needs continuity more than a residential urban customer. Raises the question of grounding, pointing out that most rural primary is single-phase, 7,200-volt phase-to-ground, multi-grounded, but that the general differential equation for such a circuit has not yet been set up, hence little is known about what goes on in the ground. "Analytically the ground return circuit is a special case of the general multi-grounded circuit. Once the formula for the general circuit is available, the ground return circuit can be developed by making the neutral impedance equal infinity." Suggests that ground return circuits can be more generally used. Argues that further reduction of distribution transformer core losses is desirable and attainable.

O. W. Gatchell, of Lamar, Mo., submitted a discussion suggesting that: more attention be given to load-center location of farmstead transformers; raising distribution voltage to 7,620 (thus gaining 12% more capacity) be considered; rural right-of-way be purchased with consideration for future underground.

Protecting the Public

Sensitive Ground Relay Protection for Complex Distribution Circuits, Lloyd F. Hunt, Southern California Edison.

This supplements a 1939 paper in which application of such protection to radial distribution feeders was described. Since then, several years' experience have been accumulated on more elaborate schemes applied to loops. Results in operation have been very satisfactory. The protection is arranged to relay rapidly both on ground faults and phase-to-phase shorts, and to keep ground current very low, thus avoiding damage on joint poles, in hazardous areas, etc.

Mark Sawyer of Southern California Bell Telephone submitted a discussion pointing out that Bell jointly occupied 850 poles carrying 7 kv., and over 1,600 poles carrying 16 kv., to which this system is applied. Twelve contacts of power lines with telephone lines have occurred; in all cases, telephone interruptions and damage were minor.

Serving the Atom

Power System Development for Service to Hanford Plutonium Plant, by B. V. Hoard, J. R. Curtin, Bonneville Power Administration, Portland.

A discussion of the system studies and measures taken to provide "absolutely" reliable service to the war's top-secret load. As the authors point out, it is difficult to evaluate a transmission and relaying scheme aimed to accomplish an unattainable end. A number of disasters could be imagined which would interrupt service, no matter how good the serving system. The system rearrangement, the relay and load-transfer schemes employed, although a special case, are of interest to design engineers, especially as service actually was continuous.

What Insulators Can Do

Dielectric Strength of Station and Line Insulation to Switching Surges, P. L. Bellaschi and L. B. Rademacher, Westinghouse, Sharon, Pa.

The paper assumes impulse data to be reasonably complete and proceeds to examine switching surges, pointing out that this may be the critical condition on some systems and that data are needed to determine to what extent advantage can be taken of cost savings in lower insulation ratings. Test findings were that insulation strength against surge generally ran 90% to 95% of the corresponding impulse value, that rain and dew effects are no greater with respect to surge than to impulse. Further study of unusual conditions was recommended.

Columbia River Power

Columbia River Power, by Eugene I. Pease and H. W. Goodhue, both of the U. S. Engineers Office, Seattle.

While including much that has already been set forth about the region, this paper neatly assembles the historical highlights, brings the subject up to date and considers the future in terms of broad, long-range planning. The authors illustrate the magnitude of power under consideration by saying:

"Run-of-the-river prime power has been estimated at about 8,000,000 kw. Theoretical prime power available with complete stream regulation is about six times as great. This is about twice the present average electric power production of the entire U. S. Estimates of prime power available with development of storage and head to practicable limits have ranged from 15,000,000 kw. upward."

Credit is given to the Northwest power pool as one of five factors which permitted meeting wartime demands. The other factors were listed as: (1) abnormally high load factors; (2) use of stand-by steam; (3) good water conditions; (4) overloading of generators. The authors feel that of these, only the pool operations can be of assistance in planning to meet the future, the others being accidental or stop-gap measures.

Flexibility within the over-all program is urged. It is pointed out that both timing and location of plants will depend upon the way the area develops and that no program put on paper today will necessarily be the best a few years from now. The authors' predict that, based on prewar trend, present regional generating capacity would be inadequate to meet 1948 load requirements. They suggest that war-stimulated growth may have introduced a shift upward, on which basis present announced private expansions and authorized public expansions would not be sufficient to meet the loads of ten years from now.

Mechanized Calculating

The Use of Business Machines in Determining the Distribution of Load and Reactive Components in Power Line Networks, Philip D. Jennings and George E. Quinan, Puget Sound P & L Co.

Days of engineering time have been saved by Puget Sound in using accounting machines of the International Business Machines type to solve system problems. The authors regard the method as being an interum procedure for use between visits to analyzer boards and of particular value in the West because of the difficulties of getting access to the analyzers. Solution of a four-mesh network by usual methods takes from three to ten days, involves 7,680 calculations and 9,600 determinations of sign. IBM machines do the same work in four to six hours, requiring the attention of only one regular machine operator. The machines will handle determinants up to the fifth order. IBM machines utilize cards to perform a series of multiplications and additions. What series of operations they perform is determined by a formula deck of cards. Master cards carry numerical values and "assign" these values to the cards in the formula deck through punchings carried on automatically. For a determinant of the fifth order, 19,200 cards are required. Cost of these is nominal.

Consolidated-Vultee aircraft representatives indicated a more limited use of IBM machines had been made in analyzing aircraft electrical loads.

Record Break

4,370,000-kva. Short-Circuit Tests on Grand Coulee 230-kv. Bus, W. H. Clagett, USBR. and W. M. Leeds, Westinghouse.

Describes in detail a test at Grand Coulee, as described in title, believed to be the heaviest short circuit ever interrupted on any power system.

T. M. Blakeslee, City of Los Angeles, hoped the test would help clear the way for more use of actual systems as laboratories.

There was a suggestion from the floor that perhaps breaker standards should be augmented to include ability to break charging current.

Long Line Stability

Long-Distance Power Transmission —as Influenced by Excitation Systems, C. Concordia, S. B. Crary and F. J. Maginniss, G-E, Schenectady.

Analyses of the power limits of two sample systems were undertaken with a-c network and differential analyzers. One was a 200-mi. double-circuit line with intermediate switching station, the other a 600-mi. single-circuit line. On the short line, it was found that fast excitation response would increase the power limit 5% to 10% on less severe faults. On the long line, benefits obtained by distribution of synchronous condensers along the line became evident; it was felt the optimum economic number will probably be two or three.

Station Auxiliaries

Design Factors to Promote Reliability of Hydroelectric Station Auxiliaries, C. L. Kilgore, USBR, Denver.

Discusses USBR practices with regard to each category of station equipment. Points out that while separate station-service generating units have highest reliability, only the largest bureau plants have them because of cost; most existing bureau plants and practically all now being designed obtain auxiliary power through transformers tapping the main generator bus; all new designs use 3-phase transformers.

Transmission Study

Characteristics of a 400-mile 230-kv. Series-Capacitor-Compensated Transmission System, B. V. Hoard, Bonneville Power Administration.

Detailed study of many phases of the subject compensation, showing it to be very effective in increasing allowable line loading. The best general procedure was found to be design which would remove the capacitors from the line during fault period (7 cycles) and swift return after clearing. Such design increased the premium on rapid fault clearing. If capacitors are not removed during fault they must then be built to withstand the high voltages occurring during short circuits, a procedure which the author felt would be justified only where firm power is a consideration.

Hellenthal Smith Evenson

High-Line Patrol by Airplane

Montana Power Co., a pioneer in power-line air patrol, now uses this method regularly for emergency and routine inspection

W. H. Blankmeyer
The Montana Power Co.
Butte

MANY Western power companies, particularly those with systems which traverse mountainous areas, have considered the feasibility of airplane patrolling. When weather and other conditions are favorable, this method of patrolling often brings spectacular results.

The Montana Power Co. has found air patrolling distinctly useful for both emergency patrolling and routine inspection. Air patrolling was inaugurated on the system in 1942, as a means of saving outage time and manhours required for repairing breaks. Better service through improved power continuity for war industry loads resulted. Later, air patrol was adopted as routine practice on certain important lines. As early as 1925, however, this company had used a plane for line work. In that year Aubrey Knowles, now Missoula division manager, chartered a plane for a rush repair job.

In the current operations which had their beginnings in 1942, fog and bad weather have interfered very little. In general, Montana's high altitude and comparatively low precipitation are conducive to the low-level flying which is necessary to this type of work. Routine patrols are adjusted to the days when weather is good. Emergency patrols, on the other hand, are not flown unless weather conditions are suitable. Actually, the over-all deterrent effect of bad weather has been surprisingly low.

This company is fortunate in having expert mountain pilots and the appropriate planes available at a few minutes notice, thereby eliminating the necessity for the company's owning and maintaining equipment. When patrolling is necessary, a plane is chartered from a local flying service which employs pilots who are specially trained for such work.

The necessity for utilizing experienced mountain pilots in this type of low-level rough-country flying cannot be overstressed. Low-level flying of this type is extremely hazardous for the novice. The man who is trained in this work thoroughly understands air currents over mountains and canyons and knows when to expect bad conditions. He also takes extreme care never to find himself flying uphill into what might turn out to be a blind canyon, where he would have no chance of climbing out or no space to turn back. While following a line in canyons, he will always fly down hill.

The company's Missoula division takes advantage of mountain flying experience gained by the Johnson Flying Service in developing Forest Service flying techniques. These include fire spotting and dropping of men and supplies by parachute.

The Butte area is also favored with expert mountain aviators through the Fox Flying Service.

Most pilots agree closely on the type of plane best suited for line flying. Slow speed is a fundamental. This requires a large-winged plane which is not too heavy, but which has sufficient power for good maneuverability. Johnson's men prefer a five- or six-passenger Travellaire, carrying a pilot and two observers. Out of Butte, Fox uses a Cessna or a Piper Cub on some jobs, with only one observer and pilot. Larger planes such as the Travellaire require two observers in order that there be a man on each side of the plane. As the plane banks down over the line in either direction, one of the two observers will be in position for line inspection.

Showing the type of country transversed, this photograph was taken from a Piper Cub plane during a patrol flight. A 1/1,000-sec. exposure

When an emergency patrol is necessary, the division superintendent telephones the flying service that a plane is needed. The plane will be ready and waiting on the field by the time the observers drive out. A special spot-insurance agreement automatically places a $25,000 policy in effect on patrol observers; a telegram sent to the insurance company confirms each flight.

In typical cases, only 20 to 25 minutes will have elapsed from the time of line fault to the departure of the plane, provided there is sufficient daylight. This flying is strictly a daytime procedure; when a break occurs at night, the patrol flight is postponed until dawn.

By flying 50 to 100 ft. above the line and about 50 ft. to one side, the observers have a good chance to spot such trouble as open conductors, broken insulators and broken crossarms. One observer remarked that flying over long straight sections of line gives him the impression that the plane is an inverted trolley car powered from the wires below. At such close position and with plane speeds of 65 to 85 miles per hour, a practical degree of line inspection is not difficult. For example, any line condition that might cause an outage can be spotted immediately. A single broken insulator disc might not always show up, but a badly damaged string will.

The above mentioned limitation indicates that airplane patrolling cannot entirely replace the usual methods, although the frequency of ground patrols can be considerably reduced.

Division Superintendent Harry Mc-

Cann of Missoula has used air patrol mostly as an emergency measure on 160-kv. lines of wood H-frame construction. Patrolling is confined to search for an actual fault. The time saved is remarkable when it is considered that even in ideal weather a ground patrol will take about ten hours for a particular 60-mile section of line, while the air patrol will take only 20 min. to 1½ hr. flying time, including the return trip.

As an example, an actual case of trouble, caused by a break which was 57 miles out from Missoula, was located in 45 min. flying time.

Upon spotting a line fault, the air patrol determines the location as well as the extent and type of damage. The plane then proceeds back to port to dispatch a repair crew.

Further speeding of repairs on emergency jobs is achieved by Butte Division Superintendent Bill Fitzstephens through the use of two-way radio for reporting damages immediately upon locating the fault. Repairmen are thereby enabled to proceed toward the break before the plane returns.

Under the "special emergency" classification, the low-power portable-mobile radio operates on 2.726 megacycles in conjunction with several ground stations located on both the electric and natural gas dispatch systems. These ground communication points are interconnected by telephone circuits.

Under normal conditions, radio communication is satisfactory up to about 60 miles. There is reason to believe that FM equipment of higher frequency would perform more consistently in this service because of decreased interference from both man-made and natural static.

Fitzstephens, who is a flying enthusiast off the job, makes use of routine air patrol on about 250 miles of lines ranging from 60 to 160 kv. Most of these are patrolled twice a month.

Airplanes have also saved time in line surveying. An aerial photograph of the region through which a new line is proposed, allows study of the topography and prelocation of the general route. This route, drawn on the photograph, is a definite help to the ground survey party, and as a result much time is saved in the actual running of the survey line! In this procedure again, the advantages are realized when terrain is mountainous and rugged.

Regular planes have been tried but not found satisfactory because landings must be made where no fields or level spots exist.

P. J. Lynch, foreman of gas transmission, expresses hope that helicopters will eventually fill the requirements of this particular pipe-line application.

Top: Line Patrolman Tom Demmons and John Fox, owner of Fox Flying Service at Butte. These two men and the machine do most of the patrolling for the area. Bottom: This plane is used for high-line patrol in the Missoula division. The men are (from left) Bob Johnson, owner of Johnson Flying Service; Harry McCann, Missoula division superintendent; and Ralph Barns, subforeman

Radio on Freight Trains

Greater efficiency in railroad operation through use of radio on freight trains is indicated by tests made by Western Electric Co., in cooperation with the Northern Pacific Railway Co., on a new type of VHF railroad radio equipment. The tests were on runs between Seattle and Yakima, Wash., a distance of about 145 miles over the rugged Cascade Mts., and between Seattle and Portland, Ore., a distance of about 180 miles.

The new radio equipment was designed by Bell Telephone Laboratories to operate in the new 152 to 162 megacycle band to which the railroads have been assigned by FCC, and consists of a radio transmitter and receiver, handset type microphone with push-to-talk button, loudspeakers and control unit, power supply comprising a generator and inverter, and a quarter wave vertical antenna with ground plane.

Because the run over the Cascades includes long 2.2% grades, it is common railroad practice to cut in a helper engine about midway in the train. Although this practice provides an effective method of handling long freight trains over grades, it has presented the problem of coordinating the engines, when they are as much as a half-mile apart and around a curve. The new equipment made it possible to start the trains smoothly, and it was estimated that 5 to 10% over-all running time was saved on the 145-mi. test run.

New Service Supplies Know-How

Northwest power companies establish clearinghouse for solution of customer problems, technical and business

Ladner V. Ross
Director, Northwest Research Advisory Service

NORTHWEST Research Advisory Service is the name of a well-organized and coordinated system for bringing the best know-how the country affords to the solution of specific problems confronting power company customers. It was organized and is operated under sponsorship of the Northwest Electric Light & Power Assn.

This service is not limited to the application or use of electrical energy; any kind of technical or business problem is handled, except that pertaining to law or medicine. It seeks out the "expert expert" in the field of a customer's particular problem. He may be found in the research laboratories of private industry, colleges and universities, foundations or the branches of the federal government, or on the staffs of trade associations, technical magazines, or in the ranks of private consultants. Recognized reference volumes and technical handbooks sometimes provide the answers.

Northwest Research Advisory Service has no laboratories, no test tubes, no technicians and it does not compete with consultants or testing laboratories. It merely serves as a connecting link between the vast store of non-confidential technological information available from various sources on the one hand, and the specific needs of industrial plants and business firms on the other hand. The trick to its success, if there is any trick, is in knowing who has the know-how. Proficiency in *search* rather than *research* is the main function of the service.

Research Advisory Service was originated more than ten years ago by Bert H. White, vice-president of the Liberty Bank of Buffalo. Its immediate success resulted in a steady expansion in the field of banking to a point where many prominent banks now use it in their areas. During wartime, the need of small manufacturers for technical assistance—if they were to perform satisfactorily on their war contracts and subcontracts—became so apparent to military procurement officials that White, by then a lieutenant colonel in the Air Corps, was persuaded to set up a similar system within the Smaller War Plants Corporation, where it was known as Technical Advisory Service.

This proved record of success made the association's utility members anxious to secure the service for the benefit of their customers. Accordingly, they sought Mr. White's help in setting up the service in the Pacific Northwest—and on a broader scale than ever used before. The companies now offering this service are the British Columbia Electric Railway Co. Ltd., Idaho Power Co., The Montana Power Co., Northwestern Electric Co., Pacific Power & Light Co., Portland General Electric Co., Puget Sound Power & Light Co., and The Washington Water Power Co.

The writer has been loaned to the association by The Washington Water Power Co. as director, to organize and operate the Northwest Research Advisory Service for its participating members. During the initial period he is operating the service from his power company offices in Spokane, utilizing the proven methods and the same laboratories and other sources of information as are being used elsewhere under bank sponsorship.

Each power company, through its own advertising and publicity department, has an extensive program underway in support of this new service, utilizing newspaper and trade magazine advertising, colorful brochures and direct mailing pieces. Research Advisory Service has something to offer to every merchant, every wholesaler, every shop owner, every manufacturer and every farmer, in fact, almost everyone engaged in a business enterprise, both large and small.

Talks by sales department and industrial development personnel will bring the service to the attention of chambers of commerce, civic organizations, trade groups and all types of gatherings of those that are striving for greater community development. These talks will be enlivened with local "case histories," telling how some concern was assisted toward greater success through the helpfulness of Research Advisory Service and the power company representative. These case histories, taken from the company's own files, will help to give shape and substance to a type of business service

ANOTHER MILESTONE OF SERVICE
Washington Water Power Enlists RESEARCH ADVISORY SERVICE for Business and Industry, to Speed the Development of a Greater Inland Empire... with Continued Prosperity and Progress for All
In making available the complete resources of Research Advisory Service, Washington Water Power expands and rounds out a program of assistance to Inland Empire business and industry that has developed progressively for well over half a century... Through this Service, the non-confidential "Know-how" and resources of 900 of the world's greatest laboratories and institutions of research are made accessible... Thus Washington Water Power passes another milestone on the trail of community development it has long blazed toward a greater Inland Empire for all.
THE WASHINGTON WATER POWER CO

Two of the ads run by Washington Water Power Co. about new service

To Help the PACIFIC NORTHWEST BUILD for a GREATER TOMORROW
THE WASHINGTON WATER POWER COMPANY
Brings to BUSINESS and INDUSTRY
The Full Scientific and Technical Resources of
RESEARCH ADVISORY SERVICE
An expanding, prosperous industrial development of the Pacific Northwest means BETTER LIVING, GREATER OPPORTUNITIES, AND MORE ASSURED PROSPERITY FOR ALL ITS CITIZENS... To help promote this development by assisting industry to solve its technical problems, THE WASHINGTON WATER POWER COMPANY makes available to businesses in this area the non-confidential know how of RESEARCH ADVISORY SERVICE—the world's greatest connecting link between laboratories and research institutions on one hand and business firms and manufacturers on the other hand.
RESEARCH ADVISORY SERVICE is a "clearing-house" for non-confidential information available on any technical or economic problem. This is a service of proved value, never before available to industries in this area.
Free and full use of Research Advisory Service will enable Inland Empire industry to consolidate and expand the great gains made in prewar and war years. This will mean better and more stable wages, greater nearby markets for agricultural and mineral products, increased opportunities for all.
Every business and industry served by The Washington Water Power Company is cordially invited to use RESEARCH ADVISORY SERVICE. Full details will be furnished on written or phoned request to your nearest Water Power office.
THE WASHINGTON WATER POWER CO.
A Self-Supporting, Tax-Paying Business Enterprise

that otherwise may be difficult for the casual observer fully to comprehend.

There are two phases to the service, both of them made available without charge to any businessman, industrialist or farmer served by a power company utilizing the service. One is the supplying of copies of reports from a library of previously processed problems, and the other is the preparation of reports on original problems. The power companies pay all the costs of rendering these reports.

During the ten-year operation of Research Advisory Service by the banks and the three-year operation of Technical Advisory Service, some 20,000 problems have been handled, representing an expenditure on the order of a half-million dollars by the operating organizations. Careful screening of these reports has disclosed that some 1,200 of them have special merit and contain information that is currently useful, up-to-date and of widespread interest. Handy pocket indexes have been prepared for the use of power company representatives that list these 1,200 library reports under 50 subject headings.

Experience throughout the region indicates that virtually every customer who has been given a chance to peruse this index asks for a copy of at least one report—most of them ask for three or four and sometimes as many as ten or twelve. This library, never before available, is a veritable gold mine of accumulated knowledge on problems that are being faced by industry and business everywhere today.

Original reports, at the request of a customer who submits his problem in writing to his local power company, are prepared for almost any question in the realm of the five "M's"—maintenance, management, manufacturing, marketing and materials—together with the processes and equipment that may be involved. The customer's problem is then forwarded to the headquarters of the service where it is carefully analyzed.

Over the past ten years many laboratories and scientists have been visited, their fields of activity determined and their special proficiencies noted. This information has been studied, carefully listed and cross-indexed under specific headings. These files are constantly revised and brought up-to-date, and are expanded as new laboratories or other sources of information offer their cooperation from time to time. It is through this carefully developed information on highly skilled sources of knowledge that it is possible to direct the customer's problem intelligently to those particular laboratories, scientists, engineers, technical magazine editors or trade associations most likely to have the answers at hand. In forwarding an inquiry to the selected sources, the customer's identity is not disclosed, so that he may not be subjected to calls of salesmen.

In this way it is possible to open doors and utilize sources that in many cases might not be available or would not be known to the customer. By putting this kind of service on an organized basis, it is possible for the power company to render a highly personal service to its customer at a fraction of the time, effort or cost. It is a means of helping the customer to help himself.

In some cases the solution to a problem is provided by the first group of replies. In others, none of the sources consulted have the answer, but refer to still other sources which do provide it. In a few cases the first sources will answer, in effect, that the problem long has been a troublesome one and to their knowledge no solution has been found. Yet the systematic hunt is continued and sources consulted later in the search may uncover a satisfactory solution.

When a sufficient number of replies has been received to constitute a useful symposium of opinions, a report is compiled consisting of verbatim quotations from the answering letters. Each reply is identified by the name, position, organization and address of the person who is quoted, thus establishing the competency of the opinion expressed. When the report has been delivered to the customer by the serving power company, the customer may take up direct correspondence with any of the sources quoted, should he so desire.

After the report has been delivered, whether it be from the library or on an original problem, the power company representative has a further responsibility to perform that is of vital importance to the full usefulness of the service. He must call back on the customer and find out if the report gave him the information for which he was looking. If not, he must determine if other library reports or the processing of another original problem is likely to provide the desired answer. Maybe the customer has a problem for which there is no solution—after all, the world is still unfinished. Assuming, however, that the report is helpful, then it is the power company representative's job to sit down with his customer and help him to put the new information to practical use so that it will add to the growth and prosperity of that customer's business. Only when this final step is faithfully and patiently carried through to completion will the participating companies realize their objective of area development, with bigger pay rolls and a more balanced economy.

Drops Merchandising

B. C. Electric turns over direct sales to dealers

NO more merchandising of any appliances or lamps will be done by B. C. Electric after September, that company announced to the dealers of its territory, both mainland and Vancouver Island, Sept. 3.

The decision climaxes a gradual withdrawal from direct merchandising begun by W. C. Mainwaring, when he became commercial manager some 15 years ago. He had promised dealers that, as fast as the market for any appliance had been adequately developed, the company would relinquish direct sales. First to be eliminated was radio. Last to be turned over to dealers will be ranges and water heaters and lamps.

With more than 300 dealers now serving the area, a shortage of merchandise, a strong public acceptance and demand and a strong dealer cooperation program, Howard N. Walters, general commercial manager, said he felt it only right the company should cease its own direct selling and let dealers get all the available merchandise.

Further details of the revised program are promised for next month after the official announcement of the new policy is made to the trade.

Drill Accompaniment

In what is probably the first installation of its kind in the West, Dr. Harry Kaufman, San Diego dentist, has installed recorded light classical and popular music in his offices, both for the benefit of patients and visitors in the waiting room. The equipment consists of an automatic record player, amplifier system, a speaker in the waiting room, and a set of Brush-crystal ear phones for patients in each of the two dentist's chairs. The equipment was installed by Greyson Lovell, owner-manager of the Precision Radio Shop, 4008 University Ave. According to Lovell, the innovation is meeting with immediate popularity from the patients.

Lovell, who has had many years of experience in the radio repair field, opened the Precision Radio Shop in February, and is specializing in both retail and wholesale radio repair and in the installation of high-fidelity sound equipment in homes and offices. When equipment becomes plentiful, Lovell plans to add the merchandising of appliances to his activity.

Idaho Ploughs for Future Harvests

Dealers and contractors given briefing to enable them to follow through with sales of appliances and wiring as fast as they become available

LIKE the crops which grow abundantly from its rich desert soil, business has been growing briskly all spring and summer throughout southern Idaho. From a region that lost population during the war—its mechanics migrated to Western war industries, its young men and women to the armed services—the revival of business activity has been like the starting of new crops in spring. Electrical dealers have ingeniously refurbished their stores, made improvements, rearranged them, even though short of materials. Wholesale houses have expanded their facilities and others have established branches in Boise. Idaho Power Co., alert and progressive, has swung into an all-industry promotional program, even as it helped its agriculture and local industries to convert to wartime manufacture and back again. The utility likewise has launched an intensive rural line building program to reach every possible farm within its area and to serve it electricity.

Several events during the past few months, while now history, contain ideas and methods for stimulating business and preparing the market which can still be employed by other wide-awake Western communities. Among these was the "Better Living . Electrically" show which was carried throughout Idaho Power Co. territory during March, in cooperation with the Westinghouse Electric Corp. Another was the merchandising of an adequate installation to new customers connected by the company on its New Meadows-Riggins extension, where 126 of its 140 new customers were sold the idea of installing 60- and 120-amp. service entrances when they had their farmsteads wired.

Still another outstanding event was the selection of Nampa, Idaho, by *Pathfinder* News Weekly as the typical Main Street town of America of the class under 25,000 population in which to conduct a saturation experiment in sales.

In these pages, each of these events will be described from the angle of the ideas these events contain for potential use or adaptation elsewhere in the West.

New Meadows-Riggins Extension Wiring Program

The fundamental idea in the aggressive operation of Idaho Power Co. is that it is in business. It also considers the farmer to be in business, the dealer to be in business, and that business is good for the entire community. Thus, when C. J. Strike, president, and Ralph Gale, general commercial manager, determined to reach every farm with electric service, it was not in the spirit of rendering an altruistic and possibly unprofitable service for the good of the poor farmers. The whole approach was that electricity would make a poor farmer a better one if he used it intelligently and extensively. If electricity was good business for the farmer, it would be good business for the power company and good business for the electrical dealer and contractor.

Appreciating likewise that unless there was adequate copper in the wiring installations made at the beginning, the opportunity for the farmer to use electricity would be cut off and so would the opportunity for the power company to serve him. Therefore, a frontal attack was made on the matter of wiring adequacy. While plans were being made for the extension, the Idaho Power engineers worked up a simple, pictorial diagram to show why it was good business for the farmer to install a 60-amp. service entrance.

Taking this diagram and a display board, every potential customer on the line that was about to be run was contacted, either individually or in group meetings, and told the story. He was shown by diagram that an inexpensive distribution panel of at least 60-amp. capacity would save him future wiring expense, since it would provide capacity for a range, water heater, an appliance circuit, two lighting circuits and a three-wire circuit to supply either 120 or 240-volt power for the barn, milk house, chicken house, water system and yard lighting.

The demonstration panel had mount-

Elbert Kramer impersonated a banker, builder and electrical contractor, and Bob Nichols ran the sound films

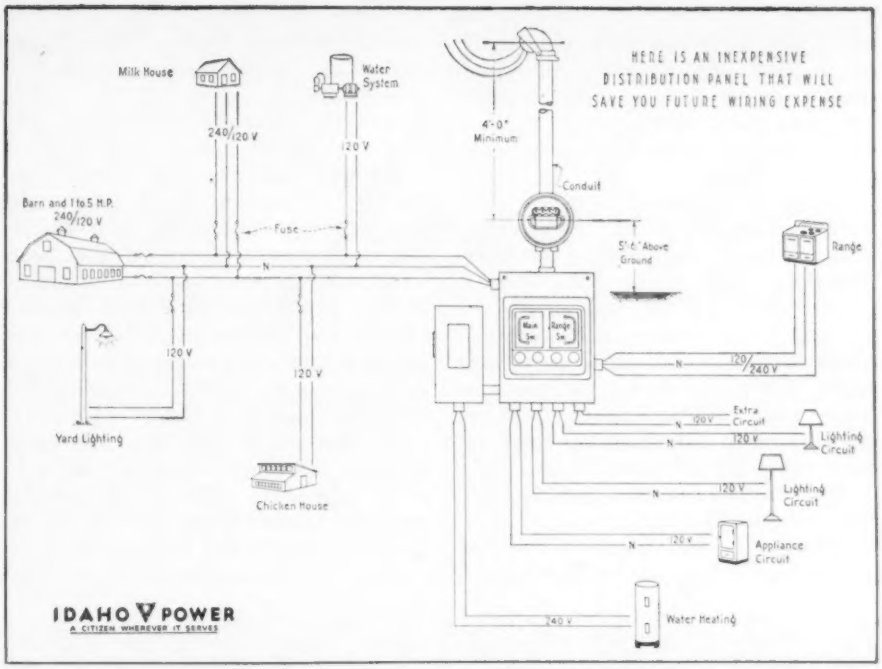
A couple from each division rehearsed and played the parts in the home planning skit that was put on each time

ed on it a meter socket, and a distribution panel and an extra circuit breaker for the water heater circuit.

Result of this educational work on the New Meadows-Riggins extension was that of the 140 new customers connected, 122 installed the 60-amp. service with the 30-amp. extra water-heating switch, and 4 installed a 100-amp. service, and only 10%, or 14, installed the 30-amp. or minimum service. The average cost of wiring the farm was $175 and in some instances went as high as $300. There were 72 yard lights sold and installed.

Each of these farms is now a good market for a range, water heater, appliances and lighting, as well as water systems, milking machines, sterilizers, yard lighting and poultry lighting and brooding equipment. Furthermore, with these facilities, each of these farms can produce its products at lower cost and with less manpower. The manpower problem has been a very grave one on the farm because of the exodus of young people from the farms to the cities during the war.

This program is being carried to all other extensions as they are being run as fast as materials are available.



This chart was used to convince new farm customers of the necessity to install an adequate service when they had their farmsteads wired for electricity

Better Living Electrically Show

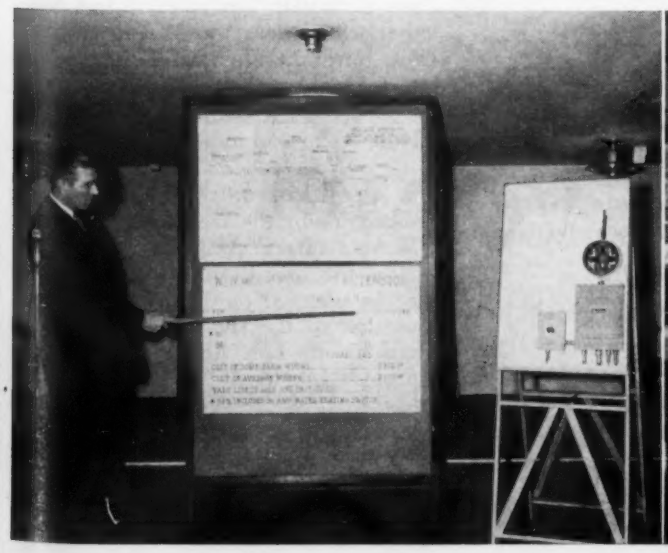
Early this year it was decided to prepare the electrical trade for business that could be done this year by a series of meetings. It was decided that the basic message which all should have first was the same one of wiring adequacy. The electrical dealers, the wholesalers, the contractors, and all the power company people needed to know the basic reasons for adequate wiring so that they could talk it and stimulate more of it. Upon it would depend the development of their business.

Advantage was taken of the fine material and the program available through the Better Homes Department of Westinghouse Electric Corp. and Westinghouse Electric Supply Co. Elbert Kramer, Pacific Coast supervisor of the Better Homes Department of Westinghouse, assisted by R. N. Nichols Jr. and Floyd Hancock of Westinghouse Electric Supply Co. and A. S. Gilbert, sales promotion supervisor of Idaho Power Co., developed a concentrated show which played to capacity houses at Payette, Twin Falls, Pocatello and Boise, traveling 660 mi. and reaching a total of 484 dealers and utility people.

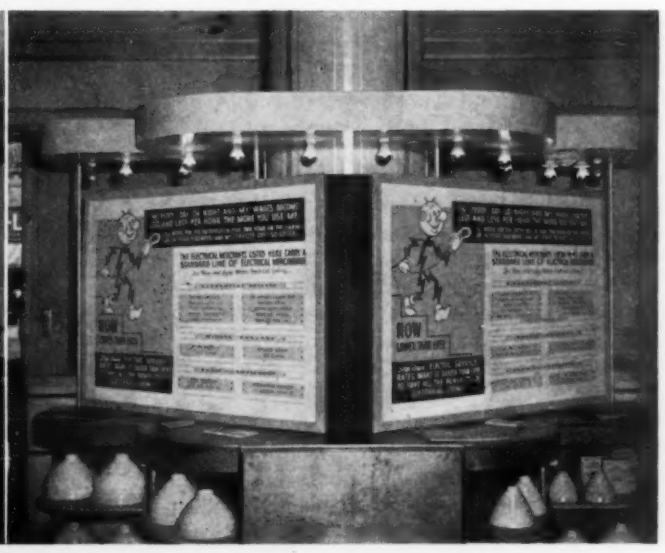
First an invitation was sent to everyone connected with the electrical industry and its associated industries. Each district manager then followed through with a reminder telephone call and saw to it that dealers came with him to the meeting. The meeting places were arranged for by the division sales manager in each division. J. A. Cameron of Westinghouse Electric Supply Co. made the arrangements for Westinghouse participation.

Into a Ford sedan, a Plymouth sedan and a ¾-ton Ford truck were packed two 16-mm. sound projectors, the Westinghouse three-room miniature display, a precipitron demonstrator, a demonstration board of safety switches and circuit breakers.

Al Gilbert told with charts and a meter and switch panel the way rural line customers had installed heavy services



In each company office a display board like this lists the names of the electrical contractors and dealers in town



The Idaho Power Co.'s residential and farm meter installation, mounted on a panel, a record player, microphones, public address systems, and a complete stock of literature, lighting equipment and other small accessories made up the kits.

As the show moved to a new division, equipment was set up and a young man and young woman from the Idaho Power Co. division sales force were recruited to enact the two characters, Joe and Jane, in the skit, *Problems of a New Home Builder*. Their parts were typed and pasted inside the pages of home and garden magazines. They were given a rehearsal or two and were ready for the show.

The program in each instance consisted of the following:

A John Charles Thomas sound motion picture, *Music in the Sky*, opened the program. The skit, *Problems of a New Home Builder*, followed. Joe and Jane, a newly married couple who were having difficulties building their new home, talked over their plans and called on the telephone a banker, a building contractor and an electrical dealer. Voices for the latter three were carried over a loud speaker system and were handled by Elbert Kramer of Westinghouse. The skit brought out the need for adequate wiring in order to enjoy the electrical appliances which would be a part of the home they wanted to build.

After greetings and introductions by the local Idaho Power Co. representatives, Kramer followed with a discussion of the "Electrical Living in 194x" program, its objectives, scope and operation. He touched upon the insufficiency of wiring materials, discussed the purpose and use of the Disney film and then made a showing of the film, *Dawn of Better Living*. Following this, he presented the Disney book and gave an explanation of its use as a sales tool. He also discussed other promotional material.

A. S. Gilbert, supervisor of sales protion for Idaho Power Co., followed with a discussion of the Curtis Publishing Co.'s survey, which pointed out that less money would be spent on wiring improvements than any other postwar home improvements unless something was done about it. He likewise showed the residential and farm wiring layouts and the standard fuse panel and meter installations, and concluded with the facts and figures on the results obtained in the New Meadows-Riggins extension involving 140 new farm customers. This illustrated the potential market there was in this program for dealers and contractors.

After a platform discussion, an invitation was extended to all to remain to view the exhibits. These included the Westinghouse three-room portable display, manned by Kramer; a precipitron demonstrator, manned by R. M. Nichols Jr., and a circuit breaker display, manned by Floyd Hancock.

Each person on leaving was presented with a kit containing samples of the Disney book, a farm book, kitchen and laundry folder, attendance card and a wiring diagram.

Attendance at Payette was 69, at Twin Falls 113, at Pocatello 65, and at Boise 237.

Margurette Reinhart returned to her old trouping ground to stage appliance demonstrations during the Nampa-test of the buying power of the small town

Pathfinder Nampa Week

Nampa, Idaho, a town of 13,800, was selected by *Pathfinder* News Weekly to test out an idea as to the strength of the small town as a buying community. Its purpose was to get a maximum of nationally advertised merchandise into town and to let the residents of both the city and its trading area know that it was there at no higher cost than elsewhere and to direct trade to the home community where it would help build local prosperity.

There are 16,340 such cities in the U. S. of less than 25,000 population. Nampa, with 13,800, has a trading area that includes 53,000 more population.

R. Baker Young, secretary of the Chamber of Commerce, stimulated all the dealers of Nampa to obtain from their national suppliers an adequate supply of all kinds of wares which could actually be sold during the week. Most of the nationally known manufacturers made a special effort to supply merchandise for the occasion.

Among the electrical manufacturers, Landers, Frary & Clark, makers of Universal household appliances, seized upon the opportunity to make a special feature of the director of its Universal Laboratory for Modern Living, Margurette Reinhart, who was formerly home service supervisor of Idaho Power Co. Miss Reinhart, during the entire week, conducted an electrical living school at the Masonic Temple with the assistance of Gertrude A. Johnson, home service advisor for Idaho Power Co. The attendance built up from 250 to 305.

Assisting Miss Reinhart were M. L. Woods, Universal salesman, and Mr. Hamilton, manager of the Boise branch of Strevell-Paterson Co., Universal distributors.

Dealers not only had rows of refrigerators, ranges, washers and small appliances in their stores, but they were all on sale.

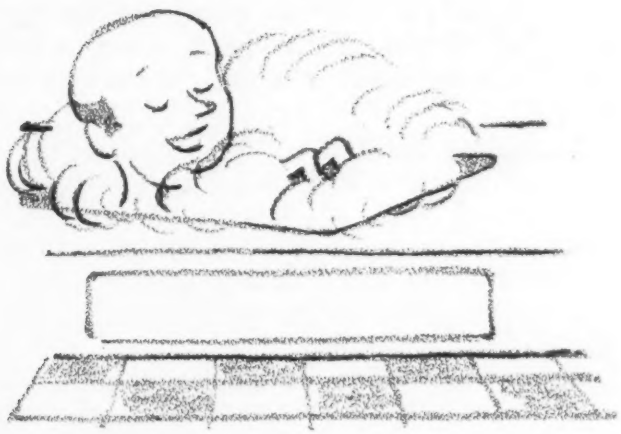
Each of the manufacturers who participated in the saturation campaign observed the reactions of the public to the full availability of merchandise and thus gained an idea of the actual market potential as opposed to the distorted wartime demand. With appliances actually on sale, it was found that while there were many spontaneous buyers, there was also a tendency to compare and to shop and therefore a need for salesmanship on the part of both dealer and appliance salesman.

● An Electronics Show is being scheduled by the West Coast Electronic Manufacturers' Assn. for October 18-20 at the Elks Club, Los Angeles. It is being planned to tie in with the convention of the Institute of Radio Engineers in Los Angeles during that period. Likewise, the Society of Motion Picture Engineers' convention will be held the following week. It will be a trade show designed for dealers and radio "hams" and sponsored by northern and southern groups of the West Coast Electronics Manufacturers.

ELECTRICAL WEST Sales Guide

FOR THE ELECTRICAL MERCHANT OF THE WEST © SEPTEMBER 1946

What Sells Water Heaters?



By J. H. ADAMS

A DEALER, the other day, received a back order of electric water heaters he had made hopefully when there weren't any and he only expected one or two.

"What do I do now?" he asked in some dismay, for it had been so long since he had had to **sell** that he did not know where to begin. The situation is one that will hit many of us as appliance production catches up with, and overtakes, demand.

Therefore, it is well to refresh the mind on the sales story on water heaters—the basic selling story that applies to any brand or make that you may handle. The mechanical features, such as insulation, thermostats and heating elements, etc., you will have to supply yourself. In most cases they should be woven into the "benefit" story. This is the way it can be presented, in your own words, of course, stressing the particular benefits that apply to the prospect:

Obviously, you should look for a water heater that will deliver an adequate supply of hot water, hot enough to perform the tasks a person has for hot water.

Proper Temperatures: Washing of dishes and many types of clothes requires temperatures of about 150°, so that is the temperature setting your water heater should have. For personal uses, such as bathing, lower temperatures are required and can be obtained by mixing with cold water. Temperatures higher than 150° are not desirable because of scaling in hard water and excessive corrosion in soft or carbonated water. With the electric water heater and its positive controls, more accurate temperatures can be maintained, assuring a supply of water at the right temperature.

Adequate Supply: The second requirement, an adequate supply of hot water, is just as important. Many types of instantaneous water heaters have been tried and found wanting. The excessive temperatures needed to heat water, as it is used, not only cause waste, regardless of whether gas, oil, or electricity is used, but also cause excessive scaling or corrosion, re-

sulting in dirty water and short life to the water heater.

Storage Capacity: The most modern method to assure an adequate supply of hot water is by storage of heated water. This means larger sizes of tanks than previously recommended and usually contemplates a full day's supply being heated during the night for the next day's needs. An average home would require a 40- to 50-gal. tank.

Efficient Storage: In storing heated water it is important that the storage tank be an efficiently insulated storage tank with a minimum of heat loss. It is wasteful to heat water and then allow that heat to escape. Your tank should be **completely** surrounded by insulation like a thermos bottle. Only the electric water heater can be so built.

Complete Insulation: There is no combustion in an electric water heater, so it requires no vents or flues which, when the heat is off in combustion heaters, expose a bare portion of the tank to the air. There are no exposed spots on the tank in an electric water heater.

Efficient Heating Units: There are two common types of heating water electrically: First, by inserting an insulated unit directly into the water in the tank. By this method all of the heat generated by the unit enters the water. There is no place else for it to go. The second method is to strap or clamp the units around the tank under the insulation, and all the heat goes to the tank and to the water. In either type, all of the heat is confined within the insulation around the tank. Such confinement of heat is impossible with any non-electric water heater.

Proper Location of Water Heater: The fact that the electric heater does not use combustion to generate heat also makes other savings possible. The water heater can be placed near the source of use in any part or room of the house **without exception.** This is not true of other types of heaters. For reasons of safety, combustion heaters are limited as to location and this item alone is a proof of the greater safety of an electric water heater.

Short Pipe Runs: The fact that an electric water heater can be put in any part of the house produces savings by making it possible to eliminate long pipe runs. Long runs between the heater and the point of use allow large quantities of heat to be

wasted. Every drop of water you draw from the hot water tap while waiting for the hot water to come has once been heated. Not only have the water and the heat been wasted, but it is inconvenient. Where the points of hot water use are grouped, it is fairly simple to locate the water heater centrally to give hot water conveniently without waste. If you have one point of use such as a bathroom in the other end of the house from the kitchen or a laundry in the garage, a separate smaller heater can be installed near the distant point of use, if you install an electric water heater

Long Life of Heater: Another feature to look for is long life. Due to the accuracy with which electricity can be controlled, excessive heat is avoided and no parts of the appliance are subjected to excessive corrosion from overheating. In non-electric combustion heaters the flame is applied to the tank and transferred through the metal of the tank. Obviously, this method of applying heat to the tank produces a hot spot and accelerates corrosion. Electric water heaters are longer lived.

Water Conditions vary and must be taken into consideration. In the main, three types of conditions exist:

1. **Hard water**—containing dissolved minerals. When heated above 160° the minerals are precipitated and deposited on tank surface. If excessive heat is applied and excessive scaling results, the water may be polluted and discolored. Electric water heaters have less scaling due to the elimination of hot spots and because the heat is accurately controlled to keep precipitation to a minimum. A small amount of precipitation in a galvanized tank over the zinc actually protects the tank. Normally a galvanized tank can be recommended for hard water.
2. **Soft water**—Does not contain minerals but may contain organic materials and may even tend to be acid. Attacks the zinc coating in a galvanized tank exposing the steel and results in corrosion. Normally a porcelain (glass) lined, Monel metal, or Everdur tank is recommended. These three types

resist corrosion and are longer lived. All three types are obtainable in electric water heaters.
3. **Carbonated water**—Some waters contain dissolved gases that are liberated by heating and the gases attack the zinc coating of galvanized tanks. Porcelain lining, Monel metal Everdur are recommended.

Advantages of Electric Water Heater: When an electric water heater is placed in the home, a completely enclosed unit is installed, free from fire hazard. Electric water heaters obtain unqualified approval on this point from the Underwriters' laboratories. This completely enclosed unit does not heat the room in which it is placed, and does not burn the oxygen out of the air. Children can play around it in **perfect safety.**

The temperature controls on an electric water heater operate automatically, providing uniform temperature without attention or manual regulation, making electric water heaters **carefree.**

The electric water heater, being completely enclosed, produces no dust, dirt, smoke, fumes or smudge, and is perfectly **clean.**

The electric water heater is **convenient** because it frees the user from care, attention and regulation.

Electric water heaters are **dependable,** both because electrical equipment can be more dependably designed and built and because there is no pilot light to go out or blow out.

Electric water heaters are **efficient** because all the heat is confined inside the insulation and all absorbed by the water. There are no flues to carry off heat when the flame is on and when the flame is off.

Electric water heaters are **economical** because all the heat goes into the water and because electric water heaters are longer lived In most localities, special electric rates are given by the utility and water can be heated at about ¼c per gallon. In the average home about 1,200 gal. of hot water are used, so automatic hot water costs the average family about $3.

Electric water heaters are **healthful** because they do not consume oxygen and do not give off poisonous gases. An abundant supply of hot water promotes cleanliness, which is one of the first prerequisites of good health.

Electric water heaters are **modern** compared with combustion heaters, as the electric lamp bulb is to the old gas jet.

These are some of the advantages you should seek in purchasing a water heater. When carefully weighed they point to the **superiority** of the electric water heater.

FOR VALUE RECEIVED— CUSTOMERS ARE PLEASED

Ninth of a series of good sense articles on business management

By Ken Hampton

LETTING customers set your retail prices is an age-old way of going out of business. It has been practiced without success by would-be merchants for centuries. The merchant, like any other worker, is worthy of his hire. The bugaboo in his affairs is the element of cost of doing business (which we may discuss in a later article), complicated by the fact that he handles sums of money as a clearing house for others. In the processes of buying and selling, he handles twenty or more times as much money as he earns. He is custodion of this money and may easily divert it to meet his expenses, salary and even return on his capital unless he both understands his responsibility well and knows his cost of doing business intimately.

Assuming that the method of marking his merchandise for sale results in putting a

fair resale price on it, there are many pitfalls of price cutting that must be avoided. In the sale of large units such as stoves, refrigerators, radios, washing machines, etc., there is a great temptation to make price concessions. This arises for the following reasons:

1. The customer is spending a relatively large amount of money (often more than one month's salary) and so acts with caution. The slowness on the part of the customer in making up his mind to buy often causes the salesperson to seek to hurry the decision by cutting prices. This, of course, is wrong because the small cut that can be made probably will not materially speed the decision, but once a concession is offered, it cannot be withdrawn.

2. The transaction often involves both a sale and a purchase due to the fact that the customer has an appliance fulfilling the same function that the new appliance is to replace. The customer wants to sell his present equipment as well as purchase the new apparatus.

Thus, the merchant is faced with both buying and selling. It is often best to have, if possible, a person trained in buying appraise the appliance to be traded in. This trade-in price should be set at a price that will enable the merchant to make his usual markup on the resale price. Under no circumstance should appraisal values be made excessive on the excuse that a large-scale sale is involved. This is price cutting. It is often well to explain to the customer that you are both buying and selling on a fair basis when stating the price offered for the trade-in appliance.

3. Fear of competition often is the excuse used to justify price cutting. Competition must be met by internal efficiencies and superior salesmanship, not by price concessions, if one is to remain profitably in business. This, of course, assumes a fair pricing policy—any other policy results in bargaining, forcing prices to a fair level and is not price cutting.

Now, a few words about profit. Custom has established fair pricing policies for most businesses. These must of course relate directly to inventory turnover, any epecially expensive local conditions (these can usually be charged for as special services, such as installment expenses, etc.), and credit losses as well as plant investment.

A merchant should follow these sound, established prices. In striving to be efficient, he must beware of the dangerous idea that he is so much more efficient than others that he can consistently sell for less, unless he has good factual information, proving this condition. This is obvious when it is realized that a 5% net profit on sales is an unusually large profit. If the merchant gives one-half of this $5 profit per $100 of sales off as a discount or excessive trade-in, it will usually not tip the scale in his favor. Once such bargaining starts, all his sales arguments become secondary to price and the points of quality are evaluated in the light of the price concession made

Perhaps the best all around advice on price cutting is DON'T. The best way to avoid it is to spend your time in making customers want your merchandise rather than having them try to buy it from you at a bargain.

Sell your product thoroughly as the best value to meet the customer's needs, at the price you have set, and you will stay in business and make a profit. Cut prices and you will operate unprofitably. This is business suicide. Through it everyone loses. The manufacturer loses his outlet, the dealer loses his livelihood, the community loses a store, the customer loses a place to buy merchandise, to get repair service and needed information.

Don't cut prices, but give fair value in the full knowledge that you as a merchant fulfill a necessary place of value in your community and so are worthy of your hire. Customers don't brag about buying from failures—they are pleased and proud to trade with substantial, reputable firms who profitably hold to a one-price policy.

How to Figure Profits — If Any

Experience has proved that but few business men have learned to figure profit properly. Remember that 20% added to cost does not yield 20% profit. Profit is properly figured on sales, and to make a 20% profit you must add 25% to cost. Keep the following schedule before you and you will find it worth many dollars in the course of a year.

5%	added	to	cost	is	4¾%	profit	on	selling price
8½%	"	"	"	"	7%	"	"	"
10%	"	"	"	"	9%	"	"	"
12½%	"	"	"	"	11⅛%	"	"	"
15%	"	"	"	"	13%	"	"	"
16%	"	"	"	"	14¼%	"	"	"
17½%	"	"	"	"	15%	"	"	"
20%	"	"	"	"	16 2/3%	"	"	"
25%	"	"	"	"	20%	"	"	"
30%	"	"	"	"	23%	"	"	"
33 1/3%	"	"	"	"	25%	"	"	"
35%	"	"	"	"	26%	"	"	"
37½%	"	"	"	"	27¼%	"	"	"
40%	"	"	"	"	28½%	"	"	"
45%	"	"	"	"	31%	"	"	"
50%	"	"	"	"	33 1/3%	"	"	"
55%	"	"	"	"	35½%	"	"	"
60%	"	"	"	"	37½%	"	"	"
65%	"	"	"	"	39½%	"	"	"
66 2/3%	"	"	"	"	40%	"	"	"
70%	"	"	"	"	41%	"	"	"
75%	"	"	"	"	42 2/3%	"	"	"
80%	"	"	"	"	44½%	"	"	"
85%	"	"	"	"	46%	"	"	"
90%	"	"	"	"	47½%	"	"	"
100%	"	"	"	"	50%	"	"	"

Exotic Melody

Bandleader opens lavish record and radio shop

"A Freddy Martin Original," autographed by the famous Cocoanut Grove orchestra leader, Freddy Martin, custom-built to design by Louis Gould, motion picture art director, and sold for an appropriately "original" figure, will give the personal autograph touch to the radio retail business that only Hollywood could give it.

From a "jewel box" record shop on the foyer floor of Hotel Ambassador, Los Angeles, in which Martin plays his music in the Cocoanut Grove, this popular bandleader has opened what is probably the world's swankiest music store. Carte blanche was given to Louis Gould and he spared neither materials, craftsmanship, nor money to make it the ultra-ultra of small shops.

Air conditioned, with built-in fluorescent and reflecting spot lighting, everything in the place is custom-made and specially designed. Heavy glass shelving in cove-lighted niches supports the portable radio sets. Even the hardware is handmade for the place. Furniture and furnishings likewise were especially designed.

This business venture of the orchestra leader will make him what his publicity man calls a "triple-threat man" who publishes tunes, plays them into popularity with his orchestra and now sells the recordings. The shop enjoys six franchises for high-grade radio and phonograph equipment and records. These alone might not justify the investment in such a lavish establishment, but perhaps the custom-made, individually designed, autographed "Freddy Martin Originals" will carry the necessary margin to amortize this spectacular investment.

Robert Case, formerly with Quality Electric Co., Ltd., where he was associated with his father, Joe Case, is the manager of the record shop and music store.

As spectacular as the shop itself was Martin's method of announcing its opening to the big names of the radio, movie and music circles in Los Angeles and Hollywood. Making a special recording, using his "Concerto in B Flat" theme song as a background, Martin spoke a verbal invitation in which he asked his friends to the opening. The publicity department declares that these invitational records were delivered in person by a pretty picture starlet, Miss Pat Erickson, adorned with white angora sweater and becoming shorts.

Deep carpets, rich upholstery, custom-built fixtures and display fittings, arty lighting, make Freddy Martin's Ambassador Hotel shop a jewel case

The opening was like a Hollywood preview, for it brought together a galaxy of Hollywood stardom that must have made the lucite stars with which the lush plush upholstery was studded, seem dull in comparison.

Technical detail: Listening booths have solid brick walls to make for vault-like silence.

● UNUSUAL for a wholesaler is the course on "Practical Merchandising" which will be conducted by the management of Leo J. Meyberg Co. in Los Angeles, both as a refresher course for its selling personnel and as a government-sponsored on-the-job training program for veterans who have joined the organization. It is a lecture and discussion course designed as a practical working approach to sound fundamentals underlying successful business management and merchandising practices applied to the radio and appliance industry. Its purpose is to qualify the selling staff of this wholesaler to act as merchandising counsellors to its dealers. Its scope will encompass radio and appliance business, credit, layout and arrangement of the store, advertising, selection and training of retail salesmen, service, merchandising of phonograph records as well as product selling.

Using gay and colorful toweling for wall covering and curtains, Electra-City electric shop of Hollywood, one of the world's largest, capitalized on the traffic at the recent Home Show to advertise itself with a complete electric kitchen and with laundry equipment, sunlamps and other appliances

Market Shows Lots More Promise

Cosgrove predicts flood of appliances as factories begin to hit production stride; radios ready to pour out—labor and OPA willing

"JUST have a helluva swell time now, while you're not getting enough merchandise, because before you know it, the shoe will be on the other foot. Every manufacturer that I know of has at least doubled his prewar capacity. In spite of all the shortages and strikes, he is beginning to get materials and get into production."

This insider's picture, straight from the shoulder, was characteristic of everything else R. C. Cosgrove, vice-president and general manager of Crosley, said as he put aside his prepared speech and just talked man-to-man to the 1,000 dealers, salesmen and distributors who overflowed the big Mart Club dining room at Western Merchandise Mart, San Francisco, for the revived radio and appliance trade dinner, Aug. 7.

G. R. "Rock" Smith, vice-president of Deepfreeze Division, Motor Products Corp., and Cosgrove were the two speakers at the dinner, presided over by Louis J. Breuner, chairman, Northern California Electrical Bureau, and arranged for by George L'Amoreaux, the Mart's promotion manager, now returned from the Navy.

Reciting production figures for the appliance industry for June as compared with January, Cosgrove showed that in several categories, namely radio and refrigerators, 1941 rates of production were already exceeded. In radios 80% is in table models because of cabinet shortages. "That's why lots of us have bought furniture factories. They seem to have a seat at the table for obtaining wood," he said. Console models will soon be increasing in number. On table models, while present prices may seem too low, in 60 days they will likely seem too high, there will be so many of them to be sold.

Reading from a two-page telegram just received from Washington, "because, when you get down to Washington you can't send ten words," Cosgrove tried to explain the complicated OPA pricing situation in view of the new OPA bill which requires going back to 1940 figures as a base, "but the catch is that there are no records or figures down in Washington on '40 costs, only on '41. All that adds up to a mañana program."

Sets with FM will not be coming in any number, nor will television sets, until more stations are built. The change of frequency band by FCC also delayed this program. FM is also held back by Petrillo's ruling that would require a stand-by orchestra if the same program were broadcast over both AM and FM.

Other Cosgrove ideas in brief: automatic washers will soon parallel the refrigerator volume. Dishwashers are also coming along now, although they had not previously been so successful. The cost of distribution must be brought down to the ultimate consumer, yet, if certain services are really essential, someone must perform them and be paid for it, if not the manufacturer, then the distributor. There are two and a half times as many dealers now as prior to the war. To survive, a dealer must do more promotion, do servicing, carry stocks of parts, have educated service people. The distributor should take over the factory sales setup. Dealers should stick close to the power company, get back into specialty selling and reduce the number of lines, get time-payment plans in shape, for a larger portion of future sales will be made on time. He advised setting sights on 1948 as the real year of selling.

"There's a little squirrel in all of us," "Rock" Smith said in describing the market for home freezers and their public appeal. Although never sold in any quantity before the war, there are now 75,000 in use, but most of these, he said, "are old ice cream cabinets taken out of juke joints when gas rationing came along. They were worth about $25 as junk but were converted into freezers." There are now 79 manufacturers in the field. The prospect looks easy.

But, said Smith, in several test cities all the freezers dealers wanted were supplied, they were advertised and yet sales had to be really made in each case. "It is remarkable how fast this so-called buying demand is absorbed," said Smith. Therefore he felt that specialty selling would need to be done.

As a thousand dealers listened, G. R. "Rock" Smith of Deepfreeze outlined the future for this totally new appliance. Head-table celebrities, on facing page, included R. E. Fisher, PG and E; "Rock" Smith; Frank K. Runyan, Western Merchandise Mart; Louis B. Bruener, chairman, and R. C. Cosgrove, Crosley. George L'Amoreaux of the Mart revived the big trade dinner. On this page, a few of the many exhibitors and their dealer guests: Top, Mr. and Mrs. C. M. Stover of Olympia treated to electric-roaster-made cookies by Lois Ferris and Bert Conlin of Westinghouse. Right, Admiral's new Dual-Temp refrigerator viewed by Dickerson Brothers, W. C. and F. A., of San Jose; demonstrated by Ed Halliday of Kaemper-Barrett Co. In Edward F. Hale exhibit, Mrs. Evelyn McCooke and T. N. Biglieri show E. F. Brush, Modern Appliance Shoppe, Oakland, the first Presteline range to come West. Next, Barbara Foote and Phyllis Van Holten, PG and E home economists, Oakland, watch Fay Young, Ironrite advisor, demonstrate. G-E's new freezer chest shown to Russell J. Franck, music dealer, Alameda, by Dick Henning

He recited the appeals that would sell freezers but advised that in order to sell them dealers must: 1. Install them in their own homes to get first-hand experience with them. 2. Train their sales organizations and require evening calls when both the husband and wife can be sold together. 3. Pay salesmen adequate commissions to make such extra effort worthwhile. 4. Get identified right now as a home freezer dealer. 5. Join in group selling programs such as were used so successfully in the refrigeration campaigns.

As for the market itself, active was the word for it. But caution crept into certain lines. For instance, the hunger for anything to sell that caused dealers to buy all sorts of allied lines of gifts and gadgets and *any* make of appliance, known or not, was not present this time.

Most of the new things seen for the first time at this market have already been reported in ELECTRICAL WEST's midmonth *News-letter*. There were a few new models of older lines, expanding the line. Norge, for instance, exhibited its full 1947 line at its distributor's exhibit, that of L. J. Meyberg Co. The Admiral range and refrigerator were its 1947 models. The Jacobs' Launderall had its first showing at the market. However other automatics, such as the announced Frigidaire and Apex, were not yet to be seen. Thor's Automagic was, however.

Attendance was as heavy as at the spring market and came from even greater distances. There were even buyers from Hawaii and the Philippines, indicating that the war really is over and trade being re-established in the Pacific.

ELECTRICAL WEST

McGRAW-HILL COMPANY OF CALIFORNIA
68 POST ST. SAN FRANCISCO . 4

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Time for Another Power Pool

IMEDIATE resumption of the operation of the Pacific Southwest power pool is warranted if the utilities serving the area want insurance of their ability to serve the rapidly expanding loads. While the problem of individually meeting customer demand has not reached emergency proportions anywhere except in Arizona, there is potential danger ahead, particularly if either of the next two years should be deficient in rainfall. The time to prepare for any such possible emergency is now. The way to prepare for it is immediately to pool generating facilities of the whole area on a voluntary basis so as to secure all the benefits derived from wartime pooled operation.

The economics of power pooling are too well known to warrant repetition. What pool operation would do now would be to harness every available kilowatt-hour of electrical energy in the area and make it available where it is needed the most. It would permit the operation of oil-burning steam plants on base load with the consequent saving and storage of water in power reservoirs for possible future emergencies. It would permit the systematic scheduling of overhaul of units so that a minimum amount of capacity would be out of service at any one time. It would take advantage of maximum diversity between systems with consequent saving of capacity.

Principles of pool operation have been worked out during the war. So too has the accounting procedure. No engineering and no major construction would be necessary to begin operating tomorrow. Personnel is thoroughly familiar with methods and techniques.

Cooperation now in inaugurating pool operation may save embarrassment and compulsion at some later date. Furthermore it would be in the best interests of the public.

He Had Faith

FEW are the electrical pioneers living today who will remember the memorable "battle of the currents" of more than half a century ago. To them this year and this month will have a personal significance; to others in the industry the date—October 1946—is historical in an impersonal sense. The month and year mark the centennial of the birth of George Westinghouse, the year alone the fiftieth anniversary of the first long-distance transmission of alternating-current electricity. The full impact of George Westinghouse's inventive genius and promotional and developmental sense on the electrical industry and, in turn, upon the industrial economy of America, can be shown from a cataloguing of just a few of his activities: he pioneered the development of alternating-current distribution and utilization; he engineered the first large hydroelectric installation and he led in the development and application of the steam turbine for power generation and marine propulsion. He had a favorite personal axiom, one which the industry might well remember and adopt: "I don't think of the past. I think of what I am going to do tomorrow."

Call the Junk Man

EVEN though it is now more than a year since V-J day, the war isn't over officially. Not only is world peace still only a hope, but so too are many of the products and services which people expected within a reasonable time after the end of actual fighting. Many of the war-time controls are still in force—notable some priorities and price control. Materials which were deficient during the war are still in short supply.

Anyone connected with appliance manufacturing knows that steel is the bottleneck that is holding back production. One of the things that controls steel is scrap and the supply of scrap is the lowest in history. Reasons such as strikes, labor shortage, uncertain prices and the like are immaterial—the problem is to get out the scrap so that production can approach demand. So an appeal is being made for all industry to clean house. The utilities are

large users of steel. If they can collect all of the scrap that might be cluttering up warehouses and storage yards and put it into commercial channels, they will be accelerating the delivery of equipment which is being denied to them at present by the steel shortage.

Cream Puffs Forever?

ONE of the great misconceptions on the part of many dealers who expect to reap rich profits from the pent-up consumer demand for all kinds of durable goods is that no selling will be necessary (the OPA thinks the same way). They confidently expect appliances and equipment to be snatched off their floors as rapidly as they are received. Currently this is happening. But most experts in merchandising look at it as a temporary phenomenon. Once the distribution pipeline is filled and dealers have something like normal stocks, they predict that an era of competitive selling will begin again.

The sales counselor of one of the Western power companies reports that he must constantly work against the complacency stemming from this misconception. In the sales classes which he conducts for dealers and their salesmen he has developed a standard procedure for opening every one of his classes. His statement goes like this: "Before we review the lessons in salesmanship learned in our last class, let's begin with the following premise. Your floors and shelves are completely stocked with appliances and supplies — your warehouse walls are bulging. The distributor who supplies you has just telephoned that a whole trainload of new appliances is arriving next week and you have got to take your allotment. Now let's start selling."

Not being a seer, we won't predict the exact date this will happen. But the day is coming.

Inspectors' Problems

AT each meeting of an inspectors' chapter or section, time is usually allotted for a discussion of current problems. The field experiences of the inspectors are discussed and comments are made by other inspectors who have faced similar situations. Out of the discussions comes a better understanding of the National Electrical Code and a more uniform interpretation of its rules and regulations. It is a wholesome democratic practice.

This year the inspectors have a totally different type of "problem." It is not a technical one, nor does it stem from the absence of preferred materials which is causing such a headache about substitutions. Truly that is a problem. But within the inspectors' association itself there is an administrative difficulty. Many of the old wheel horses are retiring or have retired. Some of the officers have left the inspection ranks for other jobs. Important posts, even those as representatives of the inspectors on the all-important Electrical Committee which writes the NEC, have to be reassigned.

Like every other branch of the industry, inspection is in a period of change. Perhaps that is a good thing, for certainly this one phase of the industry cannot remain static when everything else is in such an active state. The inspectors' annual meetings in Boise and Sacramento this month will be highly important ones. Not only is there a brand new Code, but there may be need for many new selections for officers and representatives. What is done this year will bear importance for some years to come.

"SOCIAL gains," "social aims," "social objectives" have become daily bromides of our language. The necessity of a social justification for all activities and all existence is now taken for granted. There is no proposal outrageous enough but what can get its author a respectful hearing and approbation if he claims that in some undefined way it is for the "common good." . . . . The greatest guilt today is that of people who accept collectivism by moral default; the people who seek protection from the necessity of taking a stand, by refusing to admit to themselves the nature of that which they are accepting; the people who support plans specifically designed to achieve serfdom, but hide behind the assertion that they are lovers of freedom, with no concrete meaning attached to the word; the people who believe that the content of ideas need not be examined, that principles need not be defined and that facts can be eliminated by keeping one's eyes shut. They expect, when they find themselves in a world of bloody ruins and concentration camps, to escape moral responsibility by wailing: "But I didn't mean THIS." *Those who want slavery should have the grace to name it by its proper name. They must face the full meaning of that which they are advocating or condoning; the full, exact, specific meaning of collectivism, of its logical implications, of the principles upon which it is based, and the ultimate consequences to which these principles will lead. They must face it, then decide whether this is what they want or not.*—Ayn Rand, in the preface to "Anthem."

NWEL & P Meeting

Executive Committee makes plans for year

FIRST meeting of the executive committee, Northwest Electric Light & Power Assn., with James H. Polhemus as newly elected president in the chair, was held in Portland, Aug. 14. Provision was made for the four sections to hold planning meetings this fall and annual spring conferences next year as usual. The question of holding an annual convention next year was taken under advisement.

The association's activities in electric house heating were reviewed and it was decided to coordinate the studies now in progress under three committees. The house-heating research committee of the Business Development Section is continuing the gathering of user data. In the Engineering & Operation Section, two studies are in progress: one setting up a formula or method under which individual companies make their own studies of cost; the other attempting to coordinate into a uniform pattern the tests of house-heating installations contemplated this fall by five member companies. These tests are designed to find the characteristics of the house-heating load with respect to the demand, diversity and kilowatt-hour consumption for different types of house-heating installations under varying weather conditions throughout the territory.

Commenting on the studies in progress, Polhemus, president, stated that the electrical industry should be prepared to serve electric house heating to the public if the public is willing to pay for it. The problem is largely one of determining the cost of providing the service. Manufacturers, distributors, dealers and contractors each have their respective obligations along with the utilities in rendering house-heating service to the public, Polhemus said.

IES Head to Visit West

Following the Illuminating Engineering Society's convention at Quebec in September, plans are being made with Gilbert K. Hardacre, the new president of the society and manager of commercial sales for Public Service Co. of Northern Illinois, to make a tour of the West. During that tour, the Washington State Chapter, the Northern California and Southern California sections are developing plans for a lighting conference at which Hardacre and possibly several other eastern authorities on lighting will be speakers.

Tentative arrangements are being made for a lighting conference of two-day duration, possibly Nov. 14-15 in Seattle, under auspices of the Washington State and the Oregon chapters. C. T. Bakeman, regional vice-president for the Northwest, is heading up the arrangements.

The Northern California Section has tentatively set its date for either Monday, Nov. 18, or Tuesday, the 19th, for a one-day conference in San Francisco; and the Southern California Section is considering Nov. 21-22, if Thanksgiving is declared by the state governor to be Nov. 28. No further details of the program are available until assurances of attendance are received from eastern speakers.

Electrical Leagues Meet

Annual meeting of the International Association of Electrical Leagues, of which Victor Hartley, managing director, Pacific Coast Electrical Assn., is the president, is scheduled to be at Hotel Astor, New York City, Oct. 2-4. It is also expected from the West that there will be Clark Chamberlain, manager, Bureau of Radio and Electrical Appliances of San Diego County, and a director in the IAEL; William Quinn, manager, Southern California Radio & Electrical Appliance Assn., and Arthur Reynolds, manager, Intermountain Electrical Assn., Salt Lake City; and possibly Ralph Hubbard, managing director, Rocky Mountain Electrical League, Denver.

New Mexico Tour

Meryl E. Mentzer, field representative of the Rocky Mountain Electrical League, recently returned from a "quickie" organizational trip that took him to Colorado Springs, Santa Fe and Albuquerque, N. Mex., in the interests of adequate wiring and RMEL chapter growth. July 11 he appeared before electrical contractors of Colorado Springs with movies and materials to demonstrate the proper selling approach for adequate wiring and installation techniques. The following night he addressed the electrical group at Santa Fe, including the municipality's electrical inspector, placing special emphasis on apprentice training, which is being fostered aggressively there. On the 13th, Mentzer was featured speaker in Albuquerque at the quarterly meeting of the Associated Electrical Contractors of the state of New Mexico. At all three cities, he outlined RMEL's vigorous and comprehensive adequate wiring program which may be quickly activated by any member chapters.

Inspectors' Program

Southwest section to discuss Code changes

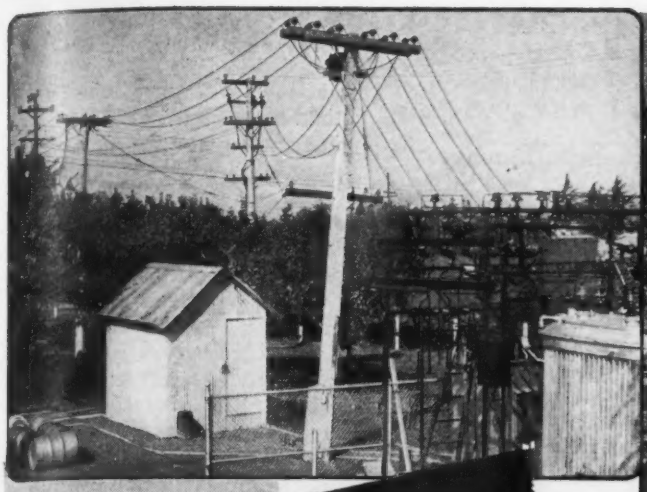
FURTHER details of the program for the annual meeting of Southwestern Section, International Association of Electrical Inspectors, at Hotel Sacramento Sept. 30 through Oct. 2, inclusive, have been announced by Harold L. Gerber, secretary-treasurer of the section. On the whole, the program will be devoted to discussions of the changes in the National Electrical Code with very few other subjects.

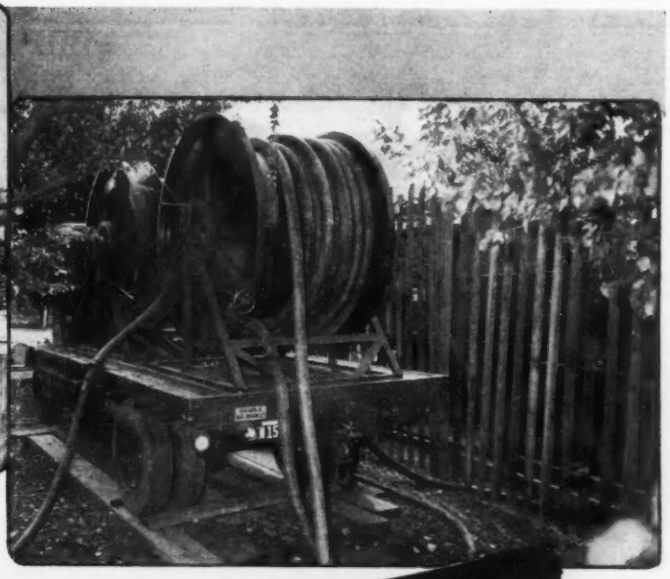
The Monday luncheon will be addressed by Vern Dodson and W. H. Schiek of General Electric Co., San Francisco, talking on "Fundamentals of Load Center Distribution." The Monday afternoon session will have a talk on "A Public Relations Committee Program for the Electrical Inspectors," by L. B. McConaghy, secretary of the Public Relations Committee of the IAEI, New York City. Paul Neese, Perfex Corp., will discuss "Application of Article 725 of the 1946 Code." This article is entirely new and deals with the handling of communications and low-voltage circuits. The Monday morning part of the meeting will be devoted as usual to the business program, with addresses by Ben C. Hill, president of the IAEI, M. C. Sandles, president of the Southwestern Section, and reports of the secretary-treasurer and of the various chapters.

On Tuesday, Joseph Siddall, manager, H. H. Robertson Co., Pittsburgh, Pa., will give one of his usual entertaining talks on "Research and You." O. E. Keeler, switchboard engineer, Westinghouse Electric Corp., San Francisco, will follow with a paper on "Transformer Network and Load Limiter Ties, As Outlined in Article 450 of the 1946 Code."

There will be Code breakfasts, both on Tuesday and Wednesday mornings. Clarence Jarvis, electrical inspector, Sacramento, will be chairman of the Tuesday morning breakfast, and Harry Dobson, city electrician, Santa Barbara, of the Wednesday morning session. Wednesday will also have a paper, "The Armored Cable System of Wiring," by H. M. Dreher, electrical engineer, National Electrical Manufacturers Assn. of New York City.

Instead of the usual dinner dance, a special event has been planned. It will be a trip to Colma, Placerville, and Jackson, viewing the old mining towns of the Mother Lode country, on Tuesday afternoon. The banquet will be replaced by a "Miner's Stew" at Jackson in the evening and recreation in





MOBILE SUBSTATION PROBLEM SOLVED

by OKONITE-ENGINEERED CABLES

"Greatly added to the versatility and usefulness of the substation" . . . "Cutting-in can be done in a matter of minutes instead of sometimes hours" . . . these are two of the results reported upon in a recent article in "Electrical West" telling how Pacific Gas and Electric Company solved a specific substation problem by the use of Okonite's high voltage portable cable for the emergency power leads.

Full details available

A 4-page illustrated reprint of this article in its entirety has been prepared. It affords a detailed case history which should be of interest to electrical engineers in public utilities or other branches of industry who must consider having emergency power facilities always available. Send for Bulletin OK-2057. The Okonite Company, Passaic, N. J.

4592

OKONITE SINCE 1878 **insulated wires and cables**

the town's various old-time night spots.

This annual meeting of the section is expected to be an exceptional one because of the retirement from active participation by a number of the "wheel horses" of the group and the necessity for a rather complete change of administration and representation.

New Wires Are Topic

The new wires and insulations formed the major topic of discussion at the last meeting of the Northern California Chapter, International Association of Electrical Inspectors at Oakland last month. R. B. Maxwell, city electrician, San Jose, acted as chairman; Nick Siggins, San Francisco, as secretary in the place of Harold Gerber; L. H. Soare, Oakland's new superintendent of the electrical division, was host. The meeting was held at PG and E auditorium.

Fred Benz, U. S. Rubber Co., San Francisco, presented first a film on the uses of rubber in the war, and then discussed the rubber situation at the present time and with it the change from rubber insulations to synthetic rubbers and thermoplastics for interior wiring purposes. After his discussion of the changes in the National Electrical Code in respect to the new insulations, he was queried by a number from the audience.

Another topic of discussion was the general breakdown of safety requirements introduced by the number of new appliances flooding the market, none of which have Underwriters' listings or testings. A recommendation was passed on to the Southwestern Section that appliance manufacturers whose products are Underwriters' listed so label them that the inspectors can quickly identify them in making field checks.

The Northern California Chapter, National Electrical Contractors Assn., furnished coffee and sandwiches at the close of the meeting.

Home Wiring by Owners?

Shortage of electricians who do home wiring and home repairs is bringing to electrical inspectors a demand from more and more home owners and renters that they be permitted to do their own wiring. This was brought out in numerous instances at the inspectors' problems discussions during the Southern California Chapter, International Association of Electrical Inspectors meeting at Santa Monica July 31. In the absence of Chairman Paul Rodet, chief of the Los Angeles Department of Electricity, because of an operation, Harry Dobson, chief inspector, Santa Barbara, presided. G. F. Wismer, electrical inspector of Santa Monica, was host to the meeting.

Owners usually have to be instructed how the wiring should be installed to comply with city ordinances. In some instances the inspector requires the owner to take a simple examination to qualify him. However, the whole matter of examinations was also revealed to be chaotic, because the state supreme court had refused to reopen the case in Fresno invalidating the necessity for city examinations to procure a license. The inspectors urged that the Contractors' License Board of California strengthen its examination requirements to include those which would qualify a contractor technically to do wiring. Other problems indicated that changeover from war production in small factories was causing rearrangement of equipment in violation of the state safety orders in many instances.

Because two members of the committee drafting a model inspection ordinance are no longer inspectors, Ken Howard, city inspector, South Gate, chairman of the committee, asked for new appointments, and W. S. Burk of Huntington Park and Larry Trim of Burbank were appointed to replace E. E. Larson and O. D. Butterfield.

Other speakers were W. E. Cranston, president, Thermador Electrical Mfg. Co., who discussed some of the manufacturers' problems in getting labor and materials, and Ted Shepherd, Department of Water and Power, who introduced H. N. Lewman of the same department. The latter discussed the requirements for power factor correction on all equipment.

Next chapter meetings are to be held Nov. 20 at Burbank and Jan. 29 at Anaheim, after the Southwestern Section annual meeting in Sacramento, Sept. 30-Oct. 2.

● WHEN the Electric Club of Los Angeles reconvenes Sept. 16, Walter L. Stickel, Leo J. Meyberg Co., will be its president; Sam W. Scott, Graybar Electric Co., first vice-president; Walter G. Willson, Westinghouse Electric Corp., second vice-president; Theodore L. Van Law, Southern California Edison Co. Ltd., third vice-president; George R. Best, General Electric Co., secretary treasurer, and D. G. Kendall, Square D Co., sergeant-at-arms. Elected to the directorate were Dean T. Smith, the outgoing president, Southern California Telephone Co.; H. L. Caldwell, Department of Water & Power; E. F. Gould, Anaconda Wire and Cable Co.; E. E. Karsten, Gough Industries Inc.; and Howard L. Stolper, Stolper Electric Co., Burbank.

EMEA Meeting

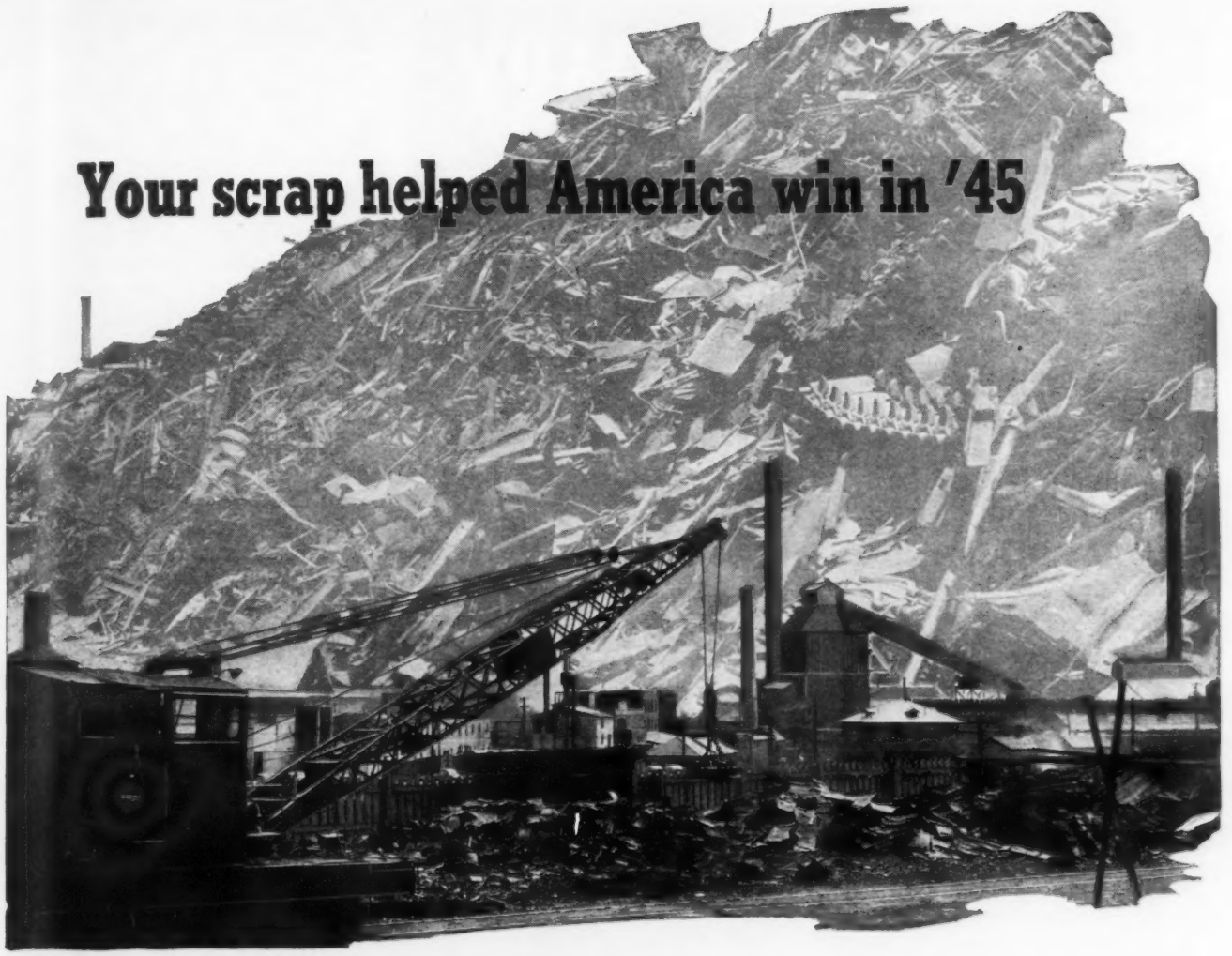
An instructive lecture was given the Southern California Electrical Maintenance Engineers Assn. at its recent meeting in Los Angeles. Fred Ireland, General Radio Corp., presented a motion picture, produced by Gilfillan Radio Co., which showed how Radar works to land a plane by instruments. He then delved into atomic structure and its relationship to insulation and conductivity. His theory, although complex, was made very clear to the layman by visual demonstrations. He then showed several instruments of great value to industry. First was an electronic ear which can differentiate between various levels of sound; then a vibration indicator; these two coupled to an amplifier gave audible perception, as well as visual, of such things as noise and vibration. A stroboscope, which appears to stop rotating equipment at the proper frequency, was also demonstrated. Making a final analysis, he incorporated all three instruments to show how a faulty gear in a complex piece of equipment could be located, first by the vibration indicator. Then with the stroboscope set at that frequency and directed at the equipment in motion, the faulty gear could be made to appear to stand still and thus be inspected for wear.—"Hank" Ledboer, publicity chairman.

Appliance Association

In addition to its big dealer meeting and conference last month, the Southern California Radio & Electrical Appliance Assn. has been active in many other projects during the past weeks. A newly formed Contractors' Division is headed up by Leo Allen of Barker-Allen Co., Hollywood. Community advertising is being done in several district newspapers. A refresher course is being given to electrical dealers in the North Hollywood district. A group insurance plan is being developed, and the membership is growing, according to William J. Quinn, manager.

The Contractors' Division meets at the "Matchless Electric Home" on Wilshire Blvd. once a month and has Code committees in consultation with Paul Rodet, chief of the electrical division of Los Angeles, and Arthur Veit, county electrical inspector.

The community advertising is simple. In one space, under the general heading of the appliance association, it lists all of the members within the area served by that community paper. This has stimulated membership and identified the members with the public. No pressure has been used to get



She needs your scrap to make steel NOW

THE present critical shortage of scrap is a serious threat to steel production.

America was literally picked bare of scrap during the war years. In recent months, industries which usually generate large quantities of scrap have been operating at low level or not at all. The result is that scrap inventories at the mills are little better than in 1942 when some open hearth furnaces were forced to shut down for lack of scrap.

Every user of steel has a direct stake in the scrap shortage. Without more scrap, producers cannot furnish you the steel needed so urgently now.

If you want steel, you can help yourself to get it by doing your bit immediately to start more scrap into channels that serve the steel mills.

QUALITY YOUNGSTOWN SERVICE

YOUNGSTOWN

THE YOUNGSTOWN SHEET AND TUBE COMPANY

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Export Offices - 500 Fifth Avenue, New York City

Manufacturers of

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Pipe and Tubular Products-Sheets-Plates-Conduit-Bars-Electrolytic Tin Plate-Coke Tin Plate-Rods-Wire-Cold Drawn Carbon Steel Rounds - Tie Plates and Spikes.

New ROYAL-NOARK Renewable FUSE
YOU'RE ALWAYS RIGHT... YOU CAN'T ASSEMBLE IT WRONG!
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✓FEWER PARTS
✓EASIER TO RENEW
✓EASIER TO ASSEMBLE
✓PROPERLY VENTED
✓RUGGED QUALITY
..you can even assemble it with your eyes closed!
✓COMPARE THEM ALL AND YOU'LL CHOOSE ROYAL-NOARK!
ROYAL
Quality WIRE • CORD SETS
CARTRIDGE and PLUG FUSES • FUSTATS
TROUBLE LIGHTS • CHRISTMAS LIGHTING SETS
ROYAL ELECTRIC CO., Inc., PAWTUCKET, R. I.

dealers to advertise in the group, but after seeing one or two advertisements, many seek space there also.

The new refresher course is being conducted at the North Hollywood commercial office of the Department of Water & Power but is sponsored by the association. Walter Eliason of the U. S. Department of Commerce addressed the group at its first session, assuring dealers that they would have all the merchandise they could sell by Christmas. The course is jointly sponsored by the schools, the State Department of Distributive Education, and the Department of Water & Power. It is held each Wednesday night.

Under the group insurance plan, members of the association may obtain benefit of mass buying for all types of insurance except health and accident. It covers compensation, burglary, fire, theft, plate glass, etc., and is placed with standard companies.

● PREPARING for the fifth annual convention of the National Rural Electric Cooperatives Assn. in Spokane in April 1947, regional officers of the Northwest Rural Electric Cooperatives met recently in that city. Committee chairmen were chosen as follows: John George Culdesac, Idaho, steering committee; Ted Waller, Spokane, housing and display committee; N. V. Fisher, Davenport, Wash., transportation; A. R. Mushlitz, Lewiston, Idaho, finance; V. P. Campbell, Spokane, reception; and Henry Hudlow, Ritzville, Wash., entertainment.

● WASHINGTON State Chapter, Illuminating Engineering Society, elected B. T. Heinz, Silvray representative, as chairman and K. E. Hollingsworth, Puget Sound Power & Light Co., secretary-treasurer. To the board of managers were named Frank T. Anderson, Westinghouse Lamp Division, Chester W. Hills, City Electric & Fixture Co., and Elmer H. Smith, Westinghouse Electric Supply Co. After summer recess, meetings will be resumed in September. Frank Anderson was chairman of the chapter last year.

● THE RELATIONSHIP of lighting to air conditioning is to be discussed at a meeting of the American Society of Heating & Ventilating Engineers, by Reuben Lagerstrom, General Electric Co. Lamp Department, Oakland, Calif., at the Engineers Club, San Francisco, Sept. 4.

● THE 20TH annual meeting of the Northwest Section of the International Association of Electrical Inspectors will be held in Boise, Sept. 23-25, J. C. Baldridge, chairman of the committee in charge of arrangements, announced.

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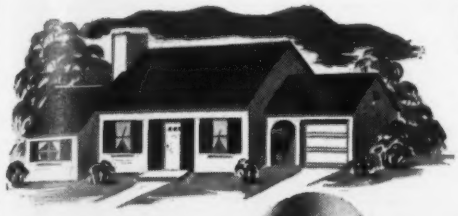
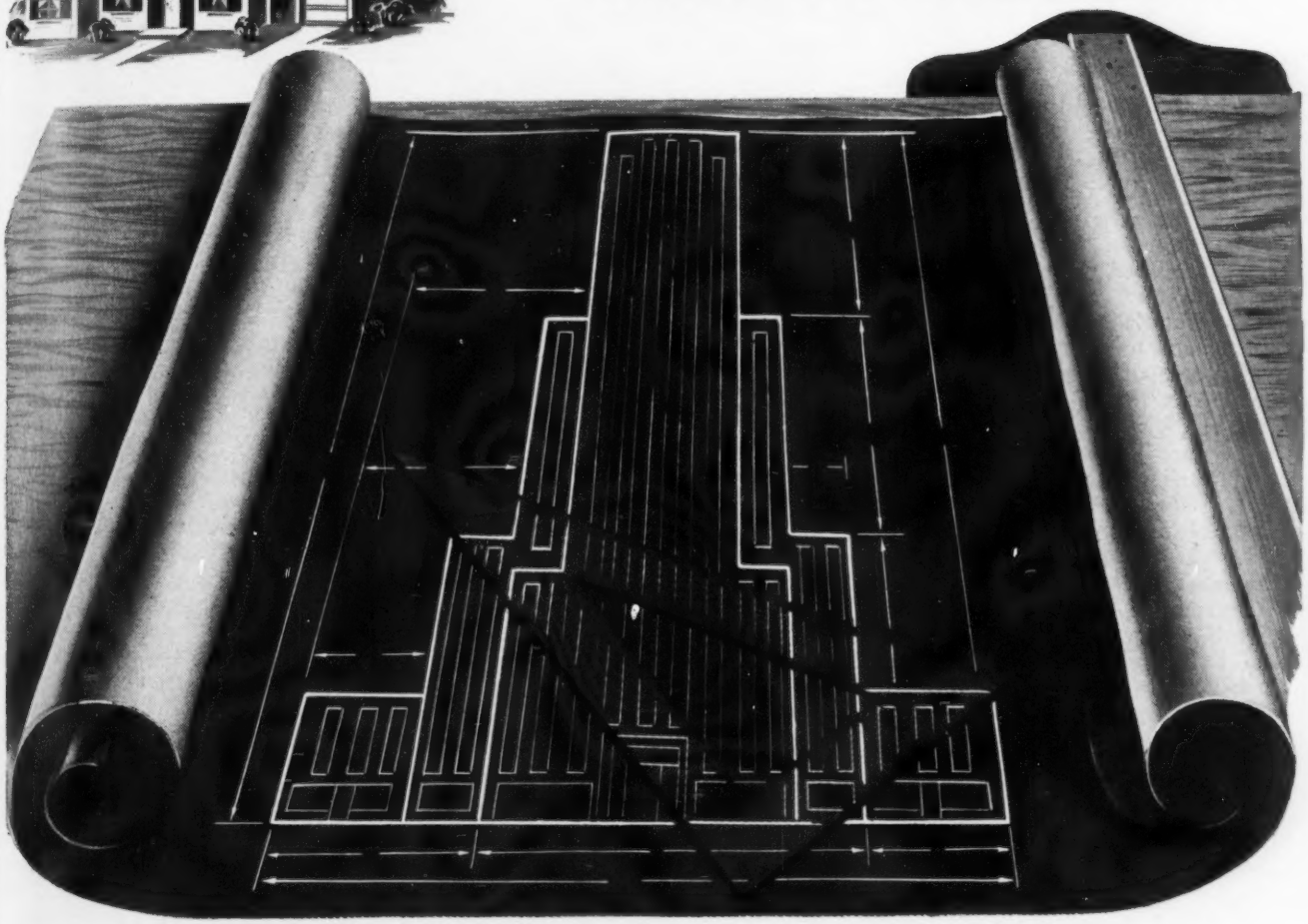


BUNGALOW OR BIG BUILDING
HERE'S THE QUESTION...



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← **SAFER** because 10 layers of pure rubber insulation guard against current leakage.

← **SAFER** because of special fibrous, flame-resistant cover.

Smaller size permits more circuits in conduit.

U.S. Laytex CONSTRUCTION

RU wiring with RU?

You're on the right track for adequate wiring—for new structures or old—if the specifications read "RU-Laytex".

For RU-Laytex, with its unique laminated insulation of purified natural rubber is today's lightest weight, smallest diameter, rubber insulated building wire.

Both in physical and electrical properties RU-Laytex leads the field. It prevents current leakage, has greater resistance to climatic deterioration, is easier to install, permits more circuits in a given space.

So keep that question in mind: "RU wiring with RU?" The right answer means greater satisfaction for all concerned.

UNITED STATES RUBBER COMPANY

1230 AVENUE OF THE AMERICAS • ROCKEFELLER CENTER • NEW YORK 20, N. Y.

NEWS of the industry

PREFERRED STOCK DRAWING NETS $7,000,000 TO HOLDERS

A drawing of the $6 preferred Washington Water Power Co. stock, which will mean the distribution of more than $7,000,000 to holders of the shares, was held recently at Spokane, Wash. All certificates held by stockholders in the company's service area as of the close of business July 29 were affected; stock outside the area will be called for payment without being drawn.

A total of 17,233 shares was drawn, leaving 35,000 uncalled shares in the area. In the first division, composed of certificates for 67 to 100 shares, 2,028 of the 5,907 shares were drawn; in the second division, certificates for 34 to 66 shares, 2,945 of the 9,125 shares; in the third division, certificates for 1 to 33 shares, 12,260 of 37,201.

All certificates were represented by cards bearing the stockholders' account and certificate numbers and the number of shares represented. All cards were thoroughly mixed and drawn by lot. Notification to those whose certificates were drawn is being made by the Washington Water Power Co., which is redeeming the shares at $110, plus $1.80 accumulated dividends.

The company declared a quarterly dividend of $1.50 per share on outstanding 6 per cent preferred stock, payable Sept. 14 to stockholders on record as of Aug. 23.

Secondary Energy Rate Filed by Bonneville

Bonneville has filed with FPC a new secondary energy rate which would make available about 75,000 kw. at a flat rate of one mill per kilowatt-hour.

According to Administrator Paul J. Raver, the energy would be sold to industrial customers for use in process operations which can be shut down for periods up to six months without serious effect on employment or economy. As a further safeguard, he said, provision is made that purchasers of secondary energy must be purchasers also of firm power or must maintain stand-by equipment sufficient to supply equivalent process requirements when secondary energy is not available.

The new rate requires payment for 90% of the amount of power made available over the contract period and provides that secondary energy will be available only to purchasers using 25,000 kw. or more. Delivery is assured for not less than 180 days in each calendar year, except as prevented by uncontrollable factors. Over periods of ten years or more, availability is assured for not less than 80% of the time.

Utilities Warned Power May Be Tight This Winter

In a letter to Pacific Northwest power company presidents, Aug. 15, D. L. Marlett, assistant Bonneville administrator, reported that the Bonneville-Grand Coulee system was loaded almost to capacity and probably would be unable to supply all company demands during the winter peak load season. He urged that the companies have their steam plants ready for operation in the fall.

"With Northwest aluminum plants scheduled to resume almost full wartime production this fall, and with other industrial, commercial and domestic power requirements increasing steadily, the Pacific Northwest faces the prospect of as tight a power situation this winter as it experienced during the war years," he stated.

"Although the Bonneville-Grand Coulee system now is meeting all requests for power from other utility systems in the region, both publicly and privately owned, it may be necessary, in order to supply the increasing demands of our public agency customers which have preference under the Bonneville Act, to restrict deliveries to private utility systems, thus requiring them to call on their steam reserves during the winter peak load season."

Equipment Shortages Curtail Space Heating

Northwestern Electric Co. and Portland General Electric Co. have notified manufacturers, jobbers and dealers of electrical house-heating equipment that material shortages make it impossible for them to accept new space heating loads at present.

The companies have asked that all such equipment be sold with the clear understanding that it may not be usable this heating season.

Applications for house-heating service made after the notification was given are being taken on a contingent basis, with the promise that connections will be made as soon as transformers and other critical materials are available.

ATTORNEYS FILE BRIEFS IN PUGET PURCHASE APPEAL

Calling the Puget Sound purchase plan a "grandiose financial transaction," A. G. Van Soolen, corporation counsel for the city of Seattle, last month challenged legality of the proposal. His brief followed those of attorneys for John Wylie and the Weyerhaeuser Timber Co., attacking authority of the Skagit PUD to issue bonds to finance the deal.

Wylie, as secretary of the PUD was ordered by Skagit County superior court to certify the bonds. The decision was appealed and was to be given en banc hearing by the state supreme court on Sept. 4. Van Soolen appeared in the case as friend of the court.

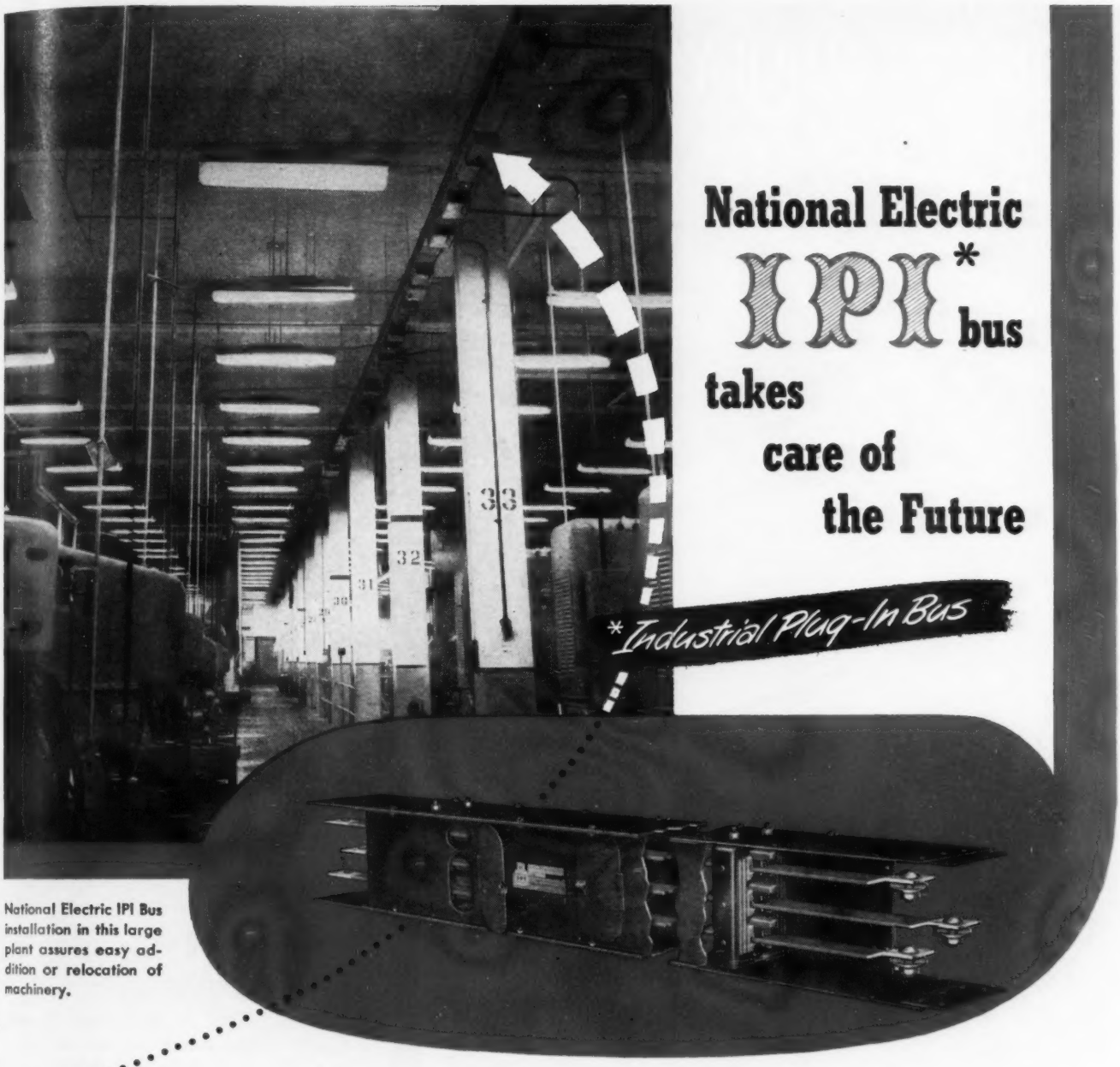
Van Soolen declared that the PUD's proposed purchase price of 135 million dollars for the system was a "seemingly gross over-capitalization" and described the $15,700,000 assigned to the possible payment of capital gains taxes as "pure water."

The city brief contended that the PUD's legal right to "acquire property within or without its limits" cannot be stretched to justify Skagit's purchase of the entire Puget Sound system.

An earlier brief filed by H. C. Brodie, Olympia attorney, contended that the Grange Power Law of 1931 was designed to foster public power as against private power and did not contemplate a situation where two public power organizations would engage in active competition in the same area.

● UNION COUNTY PUD proposal for financing purchase of California-Pacific properties within the district (E WEST, August, p. 96) were declared illegal and against public policy by Circuit Judge James W. Crawford. Judge Crawford ruled the plan an attempt to do indirectly what the PUD was not legally permitted to do directly, and enjoined the district from using any of the $925,000 bond issue authorized in 1942.

● REPRESENTATIVES from Oregon and Washington public utility commissions will meet with FPC at Portland, Sept. 17, when a concurrent hearing will be held on the proposed merger of Pacific Power & Light and Northwestern Electric companies. Request for a joint hearing was made by the two state commissions in the belief that a matter of such importance to both states should be given thorough consideration in the territory affected.



National Electric IPI Bus installation in this large plant assures easy addition or relocation of machinery.

National Electric IPI* bus takes care of the Future

*Industrial Plug-In Bus

★ A flexible, electrical distribution system.

★ Plug in new machines anytime—*without interrupting service.*

★ Bus mounted so that "Plug-In" devices can be inserted from either side, or top and bottom.

★ Bus bar sizes may be changed, increasing capacities, using same housing and insulators.

★ "Plug-In" doors every 15", side-staggering locates outlets every 7½".

★ Hanger bolts support bus independently of housing.

★ Rugged insulator assures long life.

★ Fireproof and dust-tight.

Write for complete information Today!

National Electric
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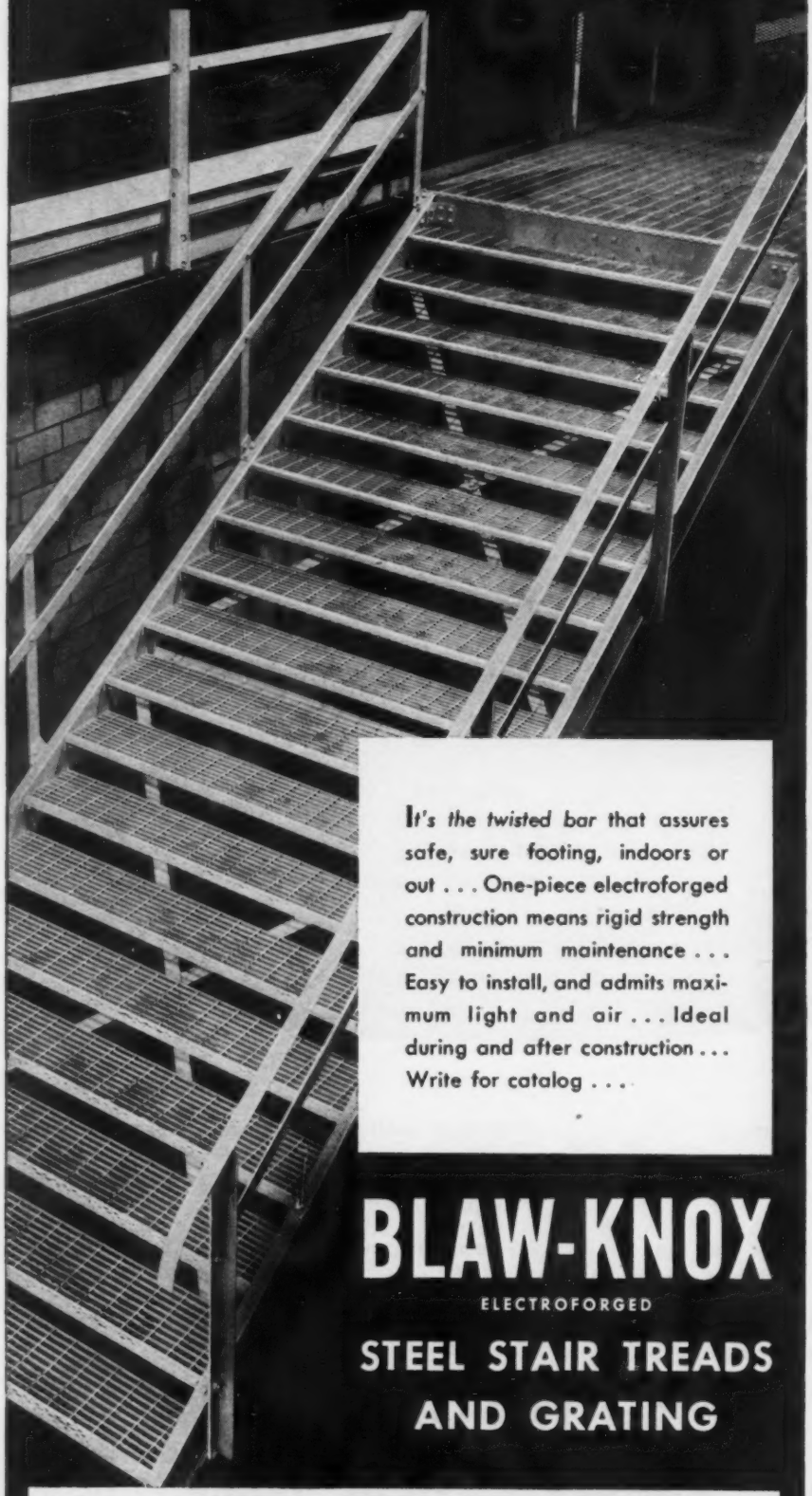
INDUSTRIAL IPI PLUG-IN BUS

NATIONAL ELECTRIC PRODUCTS WIRING SYSTEMS WIRE AND CABLE

Approved by Underwriters' Laboratories, Inc.

COULDN'T SLIP IF YOU TRIED TO!



It's the twisted bar that assures safe, sure footing, indoors or out . . . One-piece electroforged construction means rigid strength and minimum maintenance . . . Easy to install, and admits maximum light and air . . . Ideal during and after construction . . . Write for catalog . . .

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BENTON COUNTY PUD APPROVES PURCHASE

Benton County (Wash.) PUD commissioners have approved purchase of county holdings of Pacific Power & Light Co. at the $1,265,000 figure established by condemnation jury (EWEST, August, p. 96) and have authorized sale of $1,550,000 in revenue bonds.

The bonds, to run over a 30-year period, were purchased by Ballard-Hassett Co. of Des Moines, Iowa. Under the contract, they may be retired after five years. Interest is at 2% on $700,000, 2½% on $500,000 and 3% on $350,000.

Northern Wasco PUD Makes Bid for PP&L Properties

Northern Wasco County (Ore.) PUD has offered $439,451 for Pacific Power & Light Co. properties within its boundaries. According to W. J. Seufert, PUD commissioner, the amount was fixed by an Oregon Hydroelectric Commission evaluation of $450,000, made at the time the PUD was formed eight years ago.

Pacific President Paul B. McKee called the offer "inadequate and unrealistic"; pointed to the recent jury award on the company's Benton County properties, which set valuation at $1,265,000, nearly 2½ times the PUD estimate.

Valuation Fixed on Utility Properties

Valuation of Northwestern Electric Co. holdings near Kalama and Woodland, Wash., was fixed at $493,215 by a superior court jury at Kelso, Wash. The property is sought by condemnation by the Cowlitz PUD. Company witnesses estimated the value of the property at from $600,000 to $800,000 while the PUD's estimate was from $275,000 to $375,000.

Condemnation Trial Returned to Vancouver

By order of Federal Judge Charles H. Leavy at Tacoma, the scheduled trial in condemnation proceedings of Clark County (Wash.) PUD against Northwestern Electric and Pacific Power & Light companies was remanded to Vancouver. The trial was to have been held in U. S. district court on Sept. 16. Belief was expressed that the court order may delay the condemnation, since preliminary legal steps must be taken again.

PART TWO IN A SERIES ABOUT *Quality Craftsmanship*

Bushing Construction of L-M Round-Wound Transformers

Insures complete protection against weather—eliminates oil siphoning—provides convenient, accessible external clamping.

The claim that L-M Round-Wound Transformers are built with Quality Craftsmanship is backed up with the kind of construction shown here. It is one of the reasons why you can "hang L-M Round-Wound Transformers on a pole and forget 'em". The construction features of L-M's Secondary Bushing show how this convenient, easily accessible bushing is made completely weather-tight and oil-tight.

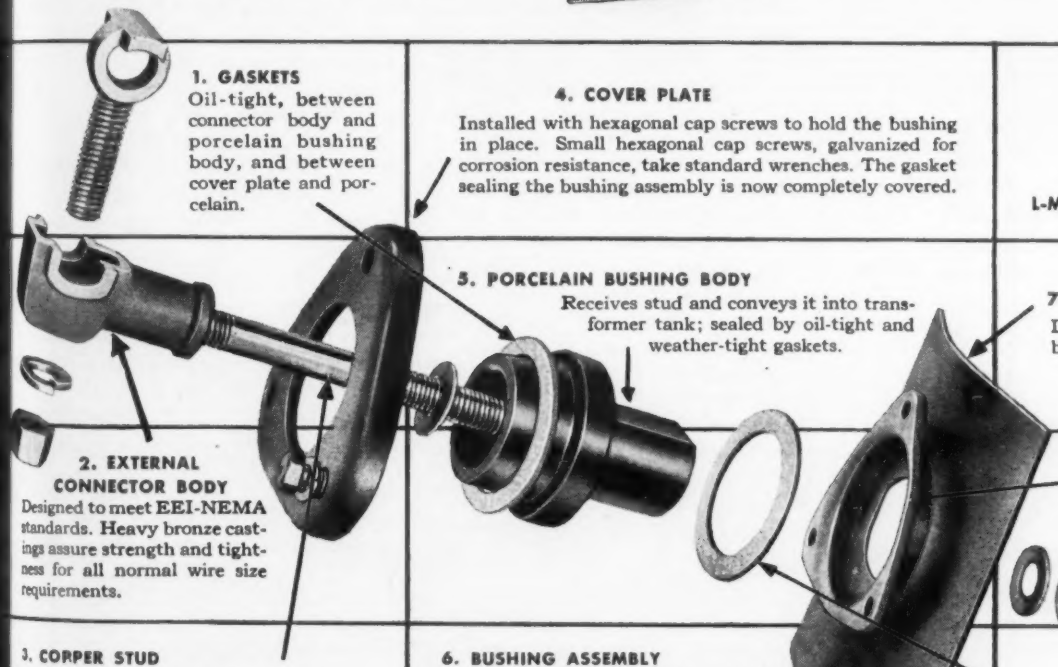
Before assembly to the transformer tank, L-M secondary bushings are pressure tested for leakage to be certain that all parts are air-tight. After the assembly illustrated here, L-M transformer tanks are placed in an inverted position with full pressure of the oil against the seals. In this test the slightest leakage can be detected.

L-M Round-Wound Transformers are made in 1½ to 25 Kva, in all distribution class voltages including 14,400 volts, and meet EEI-NEMA standards.

GET THE WHOLE STORY: ask the L-M Field Engineer for the facts on Round-Wound Transformers; or send for Bulletin RW-421. Write Line Material Company, Transformer Division, Zanesville, Ohio.

Bushing assembled with cutaway section of tank

L-M 25 Kva Round-Wound Transformer



1. GASKETS Oil-tight, between connector body and porcelain bushing body, and between cover plate and porcelain.

2. EXTERNAL CONNECTOR BODY Designed to meet EEI-NEMA standards. Heavy bronze castings assure strength and tightness for all normal wire size requirements.

3. COPPER STUD Screwed into external connector body, eliminating exposed threads. This feature, in combination with oil-tight gasket between connector body and porcelain, stops oil siphoning.

4. COVER PLATE Installed with hexagonal cap screws to hold the bushing in place. Small hexagonal cap screws, galvanized for corrosion resistance, take standard wrenches. The gasket sealing the bushing assembly is now completely covered.

5. PORCELAIN BUSHING BODY Receives stud and conveys it into transformer tank; sealed by oil-tight and weather-tight gaskets.

6. BUSHING ASSEMBLY Including copper stud (3), porcelain bushing body (5), gasket (1), and external connector body (2), is inserted into seat formed by gasket (9), and bushing support (8).

7. TANK SIDE WALL Die-punched and pressed flat for bushing gasket surfaces.

8. FLANGED BUSHING SUPPORT—Projection-welded to the tank wall.

Terminal lug

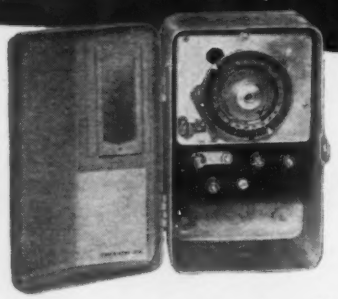
9. CORPRENE GASKET—Cushions and seals the bushing assembly to the tank wall. Gasket is seated in the bushing support and protected by it.

LM

LINE MATERIAL TRANSFORMERS

L-M DISTRIBUTION EQUIPMENT INCLUDES: Distribution Transformers • Fuse Cutouts and Fuse Links • Lightning Arresters • Oil Switches • Pole Line Hardware • Line Construction Specialties • Underground Equipment • Fibre Conduit • Street and Airport Lighting Equipment • Wired Radio Control Equipment • Capacitors

How to
SELL MORE
Poultry
time switches



Stock the New Paragon **PS-30** *and "talk" these Unbeaten Features*

1 The new PS-30 provides . . . better than any other switch . . . both morning and evening poultry house lighting with dimming period for roosting. Lighting stimulates hormones, increasing egg production without increasing feed consumption . . . when egg prices are highest.

2 The PS-30 provides uniform work day throughout winter and summer . . . plus week-end leisure for owner and family group.

3 Telechron Motored. Lowest priced complete Poultry Time Switch . . $12.75 LIST

Write for sales aids. Paragon designs and manufactures Time Controls for every need.

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BUILDERS OF ELECTRICAL EQUIPMENT SINCE 1905

OPA RETURN BLOCKS WAGE INCREASES FOR WORKERS

Higher wages for electrical workers hit a snag with the return of OPA. Many locals who had negotiated their scale up to $2 an hour immediately after the June 30 deadline on OPA, were forced to retreat and submit their claims for wage adjustment upward again to the Wage Adjustment Board. Most of the locals had applied for a $2 an hour rate last spring and had been granted varying raises, depending on the local cost of living conditions. Some were preparing a new case to ask for further increases, when OPA went out. No time was lost then to force the demand for $2 an hour and for double time for overtime. Several communities had yielded to it and others held that the raise should wait until Congress acted on OPA restoration.

Finding their fellow electrical workers on Civil Service pay rolls frozen at much lower rates, the Advisory Code Committee of the International Brotherhood of Electrical Workers passed a resolution urging cities to raise the pay of electrical inspectors. The recommendation was that no electrical inspector of a city of 10,000 population or over should receive less than $4,500 per year; and for cities of less than 10,000 population, $3,600 a year; with chief inspectors for cities of 100,000 or over, $6,500 a year. The Advisory Code Committee has on it two Western inspectors, Nicholas J. Siggins and Henry Hilpert, of San Francisco and Seattle, respectively.

The coming International Convention of the IBEW in San Francisco Sept. 2-13 promises to be enlivened by a contest for the presidency, between Ed J. Brown, of Milwaukee, the incumbent, and Dan Tracy, former president, who has until recently been assistant Secretary of Labor. It will be the first convention of the union since the war.

Seattle Union Asks for Another Wage Increase

In a petition to the Seattle city council, Local 77, Electrical Workers' Union recently asked for substantial salary increases. The petition declared that, while the union's request for a 15% increase for all City Light employees was granted for the current year, an over-all increase of only 10% was actually realized. "The increase did not, in any sense of the word, meet the 15% to which we felt we were entitled," the petition asserted.

Asking to be recognized as the "collective bargaining agency" of all City Light employees, the petitioners proposed specific wage increases for virtually all classes of light department workers, including those doing clerical work, as well as the mechanical workers.

Typical of the advances sought: from $13.50 to $14.50 per day for linemen; from $15.20 to $16.30 per day for line crew foreman; from $235-$245 to $270-280 per month for electrical appliance service men.

Pepco Trustees, Lawyer Ask Salary Increases

Salary raises for management were requested in Portland, Ore., recently, when the independent trustees of the Portland Electric Power Co. and their attorney petitioned the U. S. district court to grant them increases and bonuses.

R. L. Clark and Thomas W. Delzell, the trustees, have asked for bonuses of $37,000 each and salary increases from $500 to $1,000 a month. Their attorney, Ralph King, requested a bonus of $75,000 and a salary raise from $1,000 to $2,000 a month.

The petitioners state that Pepco's subsidiary, Portland General Electric Co., had a net income of $2,282,892 in 1945 and as of November 1945, had assets with a book value of $71,672,346. They also called to the attention of the court that the Portland Traction Co., also a subsidiary, as of Dec. 31, 1945, had assets with a book value of $18,238,971.

● WASHINGTON STATE TAX Commission recently announced that valuations of public utility properties in the state have been assessed at nearly $7,000,000 more than in 1945. Valuations for 1946 were $413,676,470, compared to a previous $406,785,750, the commission said. Among large increases were: Puget Sound Power & Light Co., from $62,800,000 to $65,000,000; Pacific Telephone & Telegraph Co., from $46,000,000 to $48,500,000; Pacific Power & Light Co., from $16,750,000 to $17,110,000.

● NATIONAL LABOR RELATIONS BOARD ordered an election within thirty days of Aug. 16 in which supervisory employees at the Long Beach steam plant of the Southern California Edison Co. will vote for or against representation by the International Brotherhood of Electrical Workers, AFL.

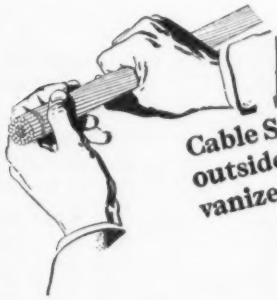
● NATIONAL LABOR RELATIONS Board has certified the Utilities Workers Union, CIO, as bargaining agent for office and clerical employees of Pacific Gas and Electric Co.

A PRIMER ON

ALCOA A.C.S.R.

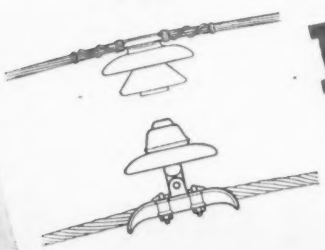
FOR NEWCOMERS

You old timers can pass up this page



A.C.S.R. means Aluminum Cable Steel Reinforced . . . aluminum wires on the outside for high electrical conductivity and galvanized steel wires on the inside for high strength.

Sizes suitable for every type of line are made in Alcoa A.C.S.R. . . . for rural feeder or tap lines, up to the largest transmission lines.



Long span construction is natural with Alcoa A. C. S. R. holding down first cost. Upkeep is low.

Advisory service is available to all who plan to use Alcoa A. C. S. R. on their lines . . . conductor sizes and strengths, permissible spans, stringing data, guidance on erection. Alcoa introduced A. C. S. R. in 1909, so this help is based on many years' experience.

Call the nearby Alcoa office for any data you need, or write ALUMINUM COMPANY OF AMERICA, 2132 Gulf Bldg., Pittsburgh 19, Pa.

ALCOA A-C-S-R

ALUMINUM CABLE STEEL REINFORCED

EASIER TO APPLY TO HOT OR DEAD LINES . . .

No. 1628-3BH Grip—maximum opening of .44", safe load 4500 lbs., weight 3¼ lbs. No. 1628-5BH Grip—maximum opening .58", safe load 8000 lbs., weight 6¼ lbs.

. . . the KLEIN-made CHICAGO GRIP!

A copy of the CHICAGO GRIPS Folder, Bulletin No. 3141, will be sent on request.

Here's a grip that's ideal for hot or dead lines. Slip a lift stick through the eye of the safety latch—the weight of the grip opens the jaws and perfect balance holds the grip horizontal. It may be slipped onto any wire in perfect safety. The safety latch also makes it possible to apply the grip close to the pole and to slide it out any desired distance—it can't fall off.

Lever action of Chicago Grips gives maximum efficiency—the harder the pull the tighter the hold. Forged parts are alloy steel, heat treated; jaws are lined with bronze. Order now—your supplier will ship your order as soon as possible.

ASK YOUR SUPPLIER

Foreign Distributor: International Standard Electric Corp., New York

KLEIN TOOLS EST. 1857

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Mathias KLEIN & Sons
Established 1857 Chicago, Ill., U.S.A.
3200 BELMONT AVENUE, CHICAGO 18, ILLINOIS

IDAHO POWER CO. MAKING INDUSTRIAL SURVEYS

Industrial surveys of southern Idaho and eastern Oregon communities are being made by Idaho Power Co., as the basis for analysis of future power needs and as an "encyclopedia" for use in answering inquiries from prospective enterprises. The work is headed by Orland Mayer, director of industrial research development for the power company.

Communities which have been surveyed by Mayer's staff, assisted by various city officials and service organizations, are Vale, Nyssa and Ontario, in Oregon; Payette, Emmett, Jerome, Wendell, Gooding and Shoshone, in Idaho. Surveying groups are now studying the industrial status of Twin Falls, Filer and Rupert, Ida., and will go into other communities later. Idaho Power divisional employees assist in the survey.

Company representatives are gathering pertinent statistics from each area in the territory served about: population, production, soil and climatic conditions, services and equipment. An expanding file is being prepared for the use of each community so that additional facts can be added from time to time and the entire project kept current. A similar file is retained by the company and a third file will be maintained in the Idaho State Chamber of Commerce offices.

In addition to the collecting and tabulating of the information, Idaho Power Co. will assist the individual towns in preparing publicity concerning their trading areas. For instance, Idaho Power assisted in the preparation of a 16-page two-color booklet for Vale as a culmination of the survey there. The booklet is entitled *Let's Have a Look at Vale, Oregon.*

● WARTIME interconnection of power facilities in the Northwest made electricity available to Mt. Pleasant, Utah, when the city's two 200-kw. hydro plants were put out of service for two weeks by a flash flood. A stand-by interconnection with the Telluride Power Co. also was knocked out by the flood, but was repaired immediately. The interconnection was set up by the Utah War Emergency Power Assn., now the Utah Electric Service Assn., and will remain in operation for peacetime use.

● WITH their monthly light bills, citizens of Anaheim, Calif., will get a $1 sanitation tax. Use of the municipal utility's billing department to raise funds for sewer improvement was decided on by the city council after attempts to pass a one-half of one per cent sales tax failed.

LABOR DAY • 1946

—Time for wise union leadership

LABOR DAY, 1946, finds one hopeful element in the relations between American management and labor which was not there on Labor Day, 1945. It comes in recent expressions by a number of national leaders of organized labor that increased "real" wages depend upon *increased productivity,* i.e. increased output per man-hour. Increased money wages which are promptly offset by higher prices do nobody any good.

If these expressions, *which still remain to be substantiated by practical performance,* come to be accepted by the rank and file of labor in each community, Labor Day, 1946, can usher in a period of great and perhaps unprecedented improvement in the economic wellbeing of wage earners—as well as the wellbeing of the country at large. If, on the contrary, they remain merely window dressing and there is a continuation of the post V-J Day process of increasing wages and then prices, the outcome can only be the bursting of an inflationary bubble, with attendant suffering for workers and the community generally.

Competition requires management to bear down heavily on increased labor productivity as a prelude to wage increases. Management, however, has rarely made a more forthright statement on the importance of increasing labor productivity than that contained in a recent issue of LABOR'S MONTHLY SURVEY, an official publication of the American Federation of Labor.

William Green, the Federation president, led off with a "message to American workers." He remarked, "Our major need is increased volume of production." Observing that "wage increases this spring have been paid for by raising prices," the survey itself goes on to say that "Today America's ability to raise wages without increasing prices and living costs depends on increasing productivity in civilian industries . . . Here is the challenge to free labor and free enterprise today: *Cooperate to increase productivity and raise living standards without strikes.*" (Italics supplied.)

The importance of increasing production was also recently stressed by Walter Reuther, President of the United Automobile Workers, C.I.O., who remarked that his union "is just as eager as management to get the (automobile) industry into maximum production." In taking this general line he was in accord with the position of Philip Murray, head of the C.I.O., who in a book, "Organized Labor and Production" written with Morris L. Cooke, remarks that, "The modern labor leader also realizes that to receive a good day's pay a man must do a good day's work and that *increased productivity has been the vital factor in the country's industrial supremacy and its relatively high wage scale.*" (Italics supplied.)

In citing increased productivity as the key to increased "real" wages these labor leaders—and management—have the historical record entirely on

SPOT CHECK ON LABOR OUTPUT

In the absence of reliable general statistics on what has happened to productivity of labor since V-J Day (because of strikes and reconversion complications) the McGraw-Hill Publishing Company asked the executives of a cross section of American industry to report their own impressions. The questions asked and summaries of the replies, which varied markedly from industry to industry and plant to plant, follow.

Question No. 1. How well have workers performed since V-J Day as compared to their pre-war effort?

Answer. Worker effort has been below pre-war. There are exceptions, particularly among older and more experienced workers; and there are quite a few signs of improvement.

Question No. 2. How much headway have you been able to make since V-J Day in improving labor productivity by better equipment and organization?

Answer. Some headway is generally being made, but it has been greatly retarded by inability to get new equipment and, in some cases, by lack of labor cooperation in improvements in organization.

Question No. 3. How much improvement in equipment and organization is to be anticipated in your business over the next year?

Answer. Marked improvement in productivity (in a few cases as much as 20 per cent) can generally be made if there is sustained production and full cooperation between labor and management.

their side. In the 40 years prior to the outbreak of World War II output per man-hour for the country as a whole was approximately doubled. Over the same period the "real" hourly earnings of industrial workers were also approximately doubled. There were, of course, great variations in the increase of output per man-hour from one line of activity to another. Also, there were periods when increases in "real" wage rates lagged behind increases in productivity. But for the 40 year period as a whole and the economy as a whole there is no mistaking the fact that the route to increased "real" wage rates was increased productivity.

Three economic factors played major roles in this doubling of production per man-hour which has made America the industrial marvel of the modern world. One was the skill and diligence of American workers. A second was the skill and diligence of American management in organizing production. A third was the improvement of machinery and the increased application of power to it.

Wartime Record

During World War II this sustained increase in the productivity of labor in *civilian* manufacturing industries, which had averaged about 3 per cent a year, was brought to an abrupt halt. Much of the most efficient segment of the nation's labor force went to war or war industry. Also, civilian industry was starved for new equipment while we equipped our arsenals. The result was that the productivity of labor in those civilian manufacturing industries for which the government keeps records actually declined throughout most of the war. By 1945 it was no higher than in 1941, whereas, if it had maintained the long run average, it would have been about 12 per cent higher. In the meantime, however, average hourly wages in these civilian industries had increased about 40 per cent.

In *war* industry, which started from low levels of production at strange tasks, there were substantial increases in output per man-hour. Many of these increases involved new processes, improved techniques, and better machines which can be adapted over a period of time to the improvement of productivity of labor in civilian industry.

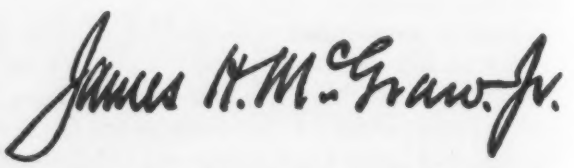
Since V-J Day, however, labor, led on by a misguided government, has had its sights on higher money wages instead of improving productivity which would have laid the foundation for increased "real" wages. Consequently, debilitating industrial strife ended in a round of wage increases which, in the absence of increased productivity, is being washed out by higher prices.

To Keep Production Rolling

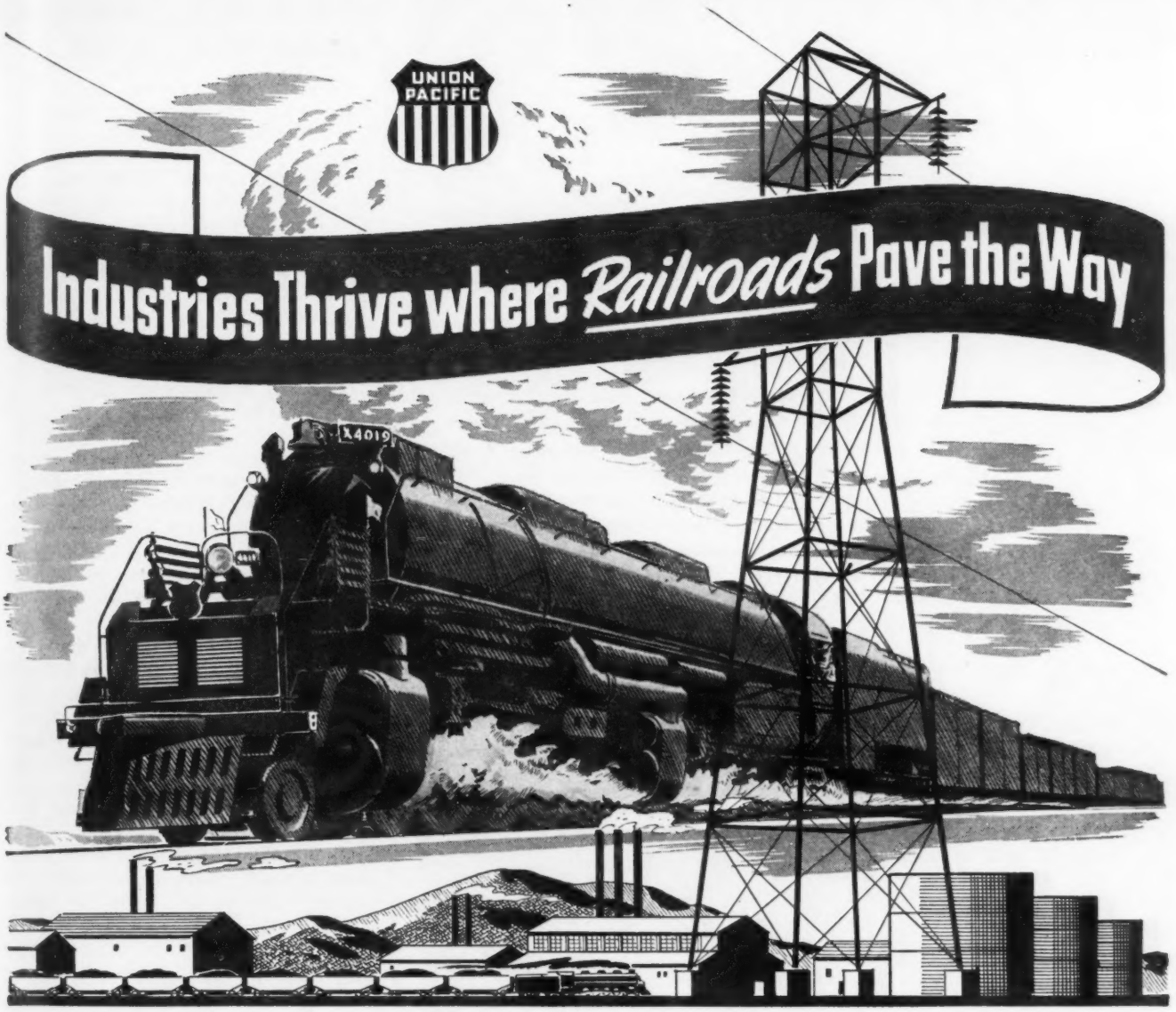
However, as indicated by the summary of a McGraw-Hill sampling of the current experience of industry in increasing output per man-hour, which appears in the center of the page, there is hope that the situation ahead can be improved. After agonizing delays because of work stoppages, material shortages, and reconversion complications, industrial production is beginning to roll again. Allowed to roll it will not be long before it will be making those advances in productivity which are the only true basis for increased "real" wages.

If the process of keeping American industry rolling to new highs of productivity is to be resumed, management must see that the past practice of translating increased output per man-hour into increased "real" wages is not only sustained but wherever possible accelerated. For its part organized labor must abandon its manifold feather bedding rules and other production-restricting practices which afflict considerable segments of American industry. Further it must give incentive systems of pay, honestly conceived and honestly administered, a fair break. *Management and labor and government and the community at large must collaborate in removing that specter of working one's self out of a job which has been one of the greatest causes of restriction of output.*

The current emphasis by leaders of organized labor on the economic truth that increased output per man-hour is the only road to increased "real" wages is important. The next step is to see that recognition of this truth seeps into the rank and file of labor and industry and becomes the basis of a program of action at the local level. If it does, and quickly, Labor Day, 1946, may mark a tremendous turning point toward sustained prosperity not only for labor but the community at large. If it does not, union leadership will fail in its responsibility and must answer to the American people for the consequences of such a failure.



President McGraw-Hill Publishing Company, Inc.



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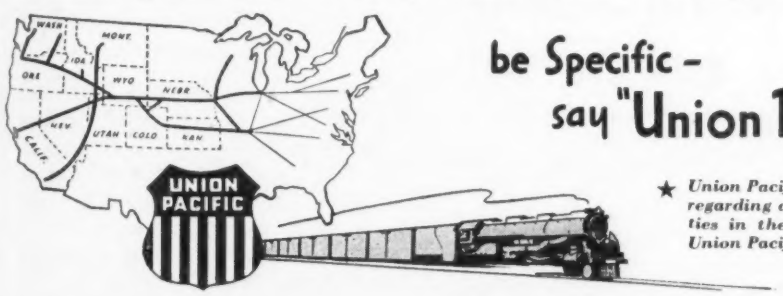

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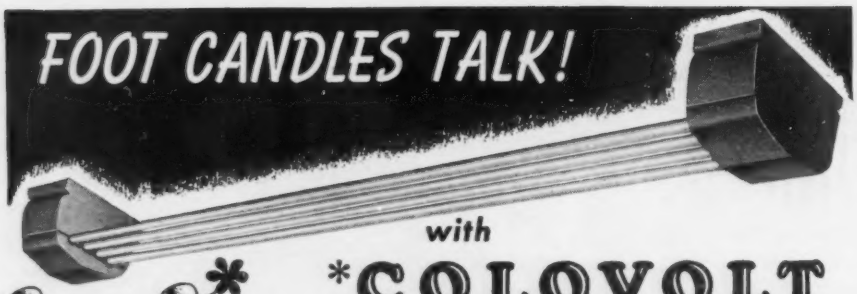

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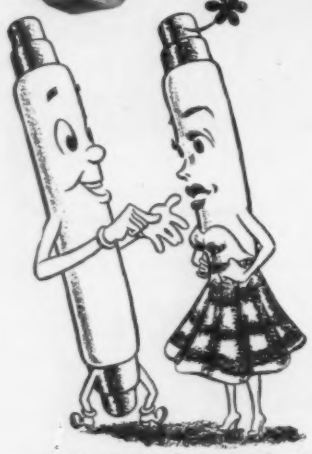

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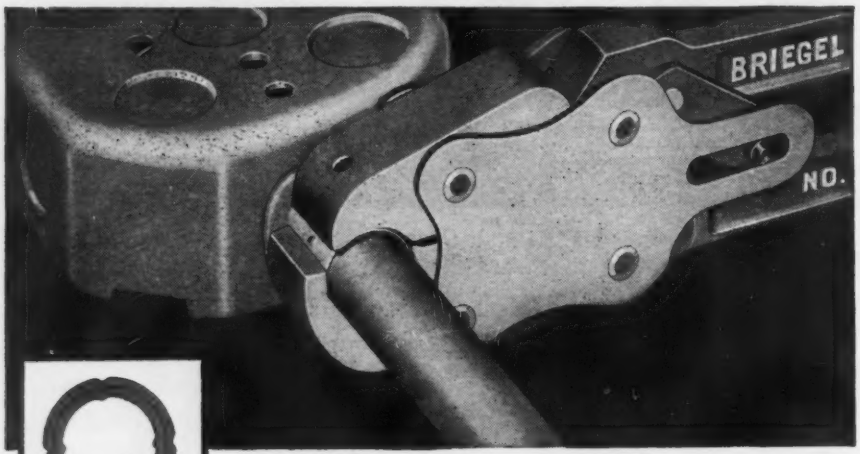

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BOKE, WISHON COMMENT ON CENTRAL VALLEY REPORT

Commenting on figures in the Central Valley Project report issued by USBR Regional Director R. L. Boke, A. Emory Wishon, vice-president and general manager of Pacific Gas and Electric Co., stated that sale of Shasta power to the company assures cheaper water for the farmers.

Boke reported total CVP earnings for the fiscal year of $4,089,762 and declared that publicly owned transmission lines are a "must" if water and power users of the area are to receive full benefits from power sales.

"It's a matter of simple arithmetic," Wishon said. "The company pays $3,750,000 per year under the power contract. The project's operating expenses approximate $400,000 per year. So from the company's payments alone there is a balance of $3,350,000 that can be used to reimburse the federal treasury and keep down the price of water.

"An important feature of the plan is that both the purchase price and the company's retail price are established by governmental agencies," Wishon continued. "The company buys the power under a contract with the Department of the Interior at a price fixed by the department and described by the former Secretary as 'fair and equitable.' It sells the power at rates fixed by the California Railroad Commission." PG and E buys the power at approximately 2.5 mills per kwh.

Hetch Hetchy Revenue Takes Drop for Year

Power revenue from San Francisco's Hetch Hetchy development for the fiscal year ending June 30 dropped $226,500 to a net of $2,202,500. Enforcement of the Raker Act last year prevented the city from selling the power at wholesale to Pacific Gas and Electric Co. Instead the city paid the company $791,000 in wheeling charges and $54,000 in line rentals for use of its facilities to distribute Hetch Hetchy power to municipal operations.

● FARMERS in Yuba and Butte counties, Calif., are protesting a USBR plan to locate a Shasta Dam high line over valuable farm land. In a telegram to California congressmen and Secretary of Interior Julius Krug, the group stated that, after agreeing to a route which would result in minimum damage to property values, USBR officials reneged without explanation. A promised hearing by Regional Director R. L. Boke or some authorized representative had not been held, the group said.

REA POWER LINE VOTED; KLAMATH CO-OP FORMED

Clearing the way for an REA power line down the Klamath River in Siskiyou County, Calif., area residents at a public hearing last month voted in favor of the line and formed the Klamath River Rural Electric Cooperative Inc. to operate and maintain it. Proposed route is from Highway 99 down river to Seiad and into Happy Camp, with short branches along Indian, Elk and Clear creeks.

Under the REA plan, the federal government would construct the line, then turn it over to the cooperative; estimated cost of $200 per user would be repayable over a 35-year period. Electricity would be served over a connection near Hornbrook with the California Oregon Power Co. system.

Copco officials earlier offered to build the line but asked that individual users sign contracts for enough power to assure a feasible business project. REA asked only that a majority of the residents in the area vote for its plan and form a co-op to act as a business agent.

Washington PUD Calls for Bids on Line Construction

Klickitat County PUD, White Salmon, Wash., will open bids Sept. 16 for materials and equipment needed to construct 340 miles of rural electric transmission and distribution lines and four substations, according to E. E. Clouse, manager.

The PUD is asking the REA for additional funds to pay for the project, which is expected to cost more than $400,000. Bids on construction will be called as soon as sufficient materials can be assembled, Clouse said.

● TRINITY RIVER ELECTRICAL Cooperative has been formed in the lower Trinity and Hoopa Valley area in California and has announced plans to seek REA aid for a line from the end of the PG and E service at Big Bear to Willow Creek and thence to Hoopa. Directors of the co-op state that there will be no installation charge other than a $5 membership fee and that use of appliances will be up to the individual, who will install his own wiring and pay a monthly premium determined by the co-op and REA.

● SURVEY work for rural electrification lines in the Horse Heaven country of south central Washington will begin during September, according to J. B. Whitehead, manager of the Benton County Rural Electrification Assn. at Prosser. A loan of $350,000 has been secured from the REA for the work.

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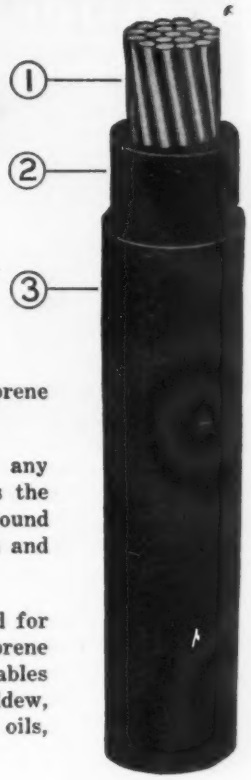

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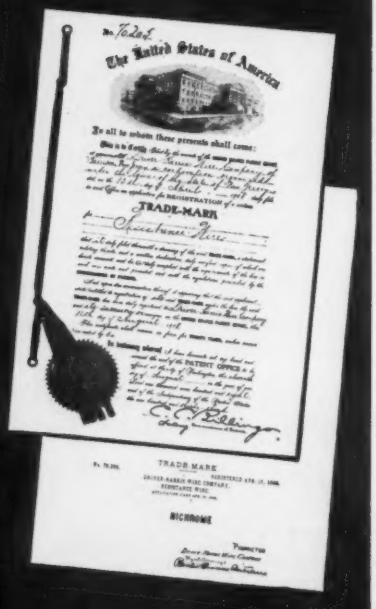

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BPA STARTS SURVEYS FOR LINE INTO SOUTHERN IDAHO

The Bonneville Power Administration will begin surveys immediately for high-voltage transmission lines into southern Idaho, Ellery R. Fosdick, Washington, assistant director of the Bureau of Reclamation's branch of power utilization, recently told directors of the Burley Irrigation District.

Fosdick was one of three reclamation officials who met with the irrigation district directors to discuss the possible transfer of the district's rights to power revenues from the Minidoka power system. With him were M. M. Smith, Washington, attorney for the bureau's power branch and Don S. Campbell, Boise, regional power manager.

Federal power will be made available at rates considerably below those now prevailing, Fosdick and Campbell said. They asserted that, as a result, revenues from the Minidoka power system would be reduced.

Bulk of the power from Minidoka Dam is used for pumping during summer and in the winter is sold by the district for commercial purposes in the Burley and Rupert areas. The plant has a rated capacity of 13,400 kw.

BPA To Market Power from Foster Creek Development

Secretary of the Interior J. A. Krug has designated the Bonneville Power Administrator as marketing agent for power to be developed at the Foster Creek project on the Columbia River, authorized for construction in the Rivers and Harbors Act passed by congress last month, D. L. Marlett, assistant Bonneville administrator, has announced.

The Foster Creek project will be constructed by the U. S. Army Engineers and will be located approximately 53 miles downstream from Grand Coulee Dam. Plans call for installation of sixteen 64,000-kw. generators giving the plant a total rated capacity of 1,024,000 kw. Designed primarily as a power project, Foster Creek Dam ultimately will be one of the largest plants in the series proposed on the Columbia.

● A $366,399 Bureau of Reclamation contract for construction of a power plant on the Shoshone River near Cody, Wyo., has been awarded to Samuels and Franklin, Los Angeles, and the Gibbons and Reed Co., Salt Lake City, on a joint low bid. The 5,000-kw. plant, part of the Heart Mountain division of the Shoshone reclamation project, will be located three miles below Buffalo Bill Dam.

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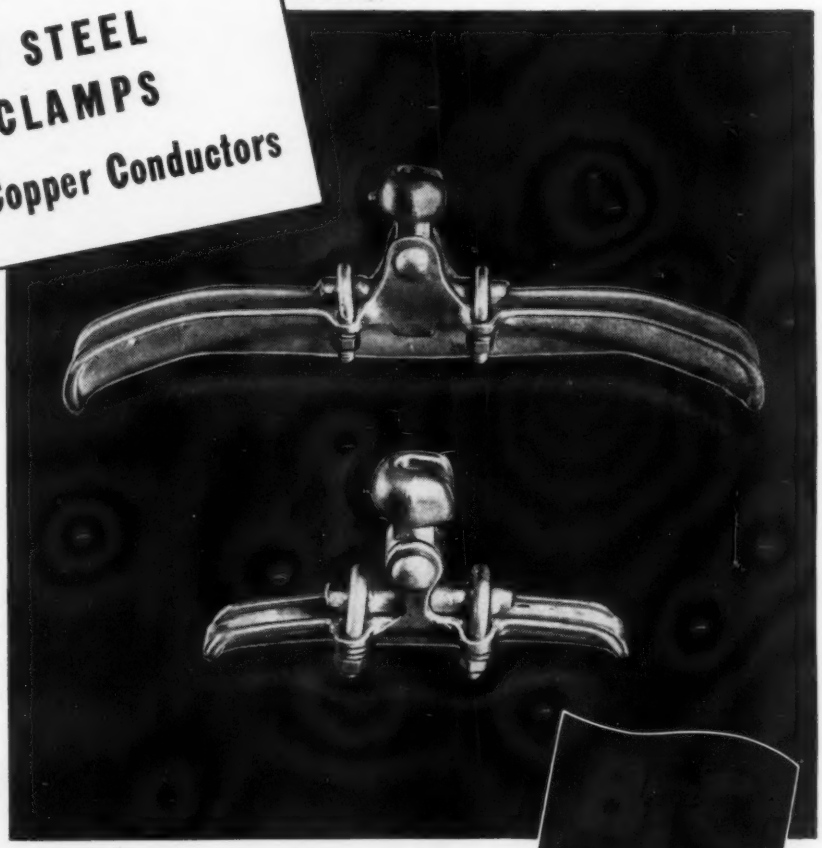

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On account of the numerous conductor types and diameters, B.T.C. Suspension Clamps are produced only on special order but complete production tooling is available for many of the popular sizes. Complete information as to cable manufacturer, type, design number, diameter, and strength of conductor, as well as the maximum expected vertical line angle, should be supplied when inquiring about or ordering Clamps.

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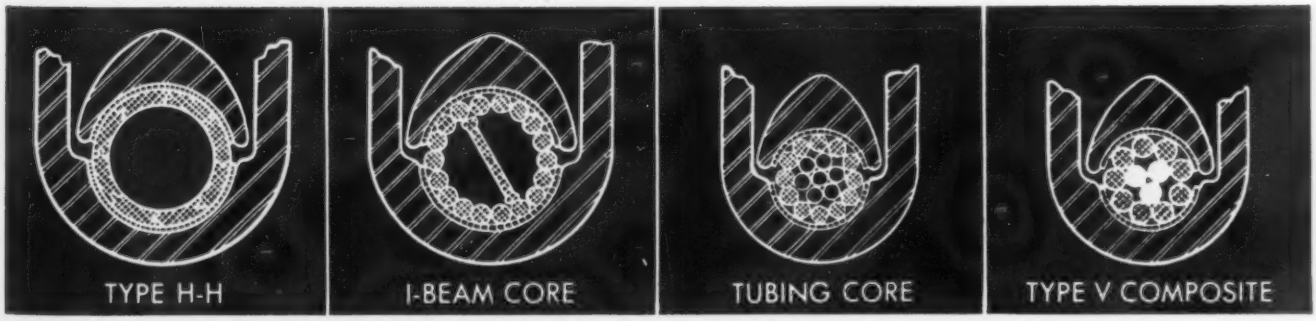

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ALLIS-CHALMERS AWARDED BIG-THOMPSON CONTRACT

Additional electrical equipment for the Sterling and Holyoke substations on the Bureau of Reclamation's Colorado-Big Thompson project will be ordered under a $81,409 contract awarded to Allis-Chalmers Mfg. Co.

The contract calls for one 6,000-kva. power transformer, six 833-kva. power transformers, two 10-kva. distribution transformers, three single-pole lightning arresters, and two 300-kva. automatic step-voltage regulators. All the equipment is to be of the outdoor type.

The Sterling substation is on the South Platte River, near Sterling, Colo., and the Holyoke substation will be built 50 miles to the east. The two are part of a power system that ultimately will consist of six plants with a total installed capacity of more than 152,000 kw. About 688,000,000 kwh. of energy will be developed annually.

The Green Mountain power plant on the western slope of the continental divide, containing two 10,800-kw. generating units, is already in operation. Bids have been called on Mary's Lake and Estes Park power plants, near Estes Park, Colo., which together will have four generating units furnishing about 180,000,000 kwh. annually.

Nearly 200 miles of the transmission system, which varies from 33,000 to 115,000 volts, have been built.

USBR Lets Contract for Oroville-Sacramento Line

A $281,760 contract for construction of the 56-mi. Oroville-Sacramento section of the Central Valley Project's 230-kv. line from Shasta Dam has been awarded to H. H. Walker Inc. of Los Angeles. The line eventually will be extended to Tracy, Calif.

The line will extend from the Oroville terminus of the existing Shasta-Oroville line to the county line between Placer and Sacramento counties, about 14 miles northeast of Sacramento. It will be a steel-tower structure and will use 500,000 cir. mil expanded type copper conductor.

● WESTINGHOUSE submitted low bid of $3,290,000 for construction of the first three generators for the right power house at Coulee Dam. Specifications call for units capable of carrying continuous loads of 120,000 kw. The Newport News Shipbuilding & Drydock Co., on a bid of $2,213,800 for three, received the contract for 165,000-hp turbines to operate the generators. The Woodward Governor Co. of Rockford, Ill. was low bidder for governors, bidding $121,200 for three.

LINE UNDERWAY TO SUPPLY ENERGY FOR DETROIT DAM

Power for construction of the Detroit Dam on the North Santiam River in the upper Willamette Valley will be supplied by Bonneville over a 46-mi. transmission line to be built from Chemawa Ore. to the Detroit Dam site, S. E. Schultz, Bonneville chief engineer has announced.

Contract for survey work on the right-of-way for the 230,000-volt, woodpole line has been awarded to the General Engineering Co., Seattle, and three survey crews with headquarters at Stayton, Ore., are completing preliminary surveys, Schultz reported.

The new line, which will be operated initially at 115,000 volts, will interconnect with one of Bonneville's two 115,000-volt Oregon City-Salem lines at a temporary switching station to be located near the Chemawa Indian school, six miles north of Salem. A temporary 115,000-volt substation will be constructed by Bonneville at the Detroit Dam site to provide power for construction of the project.

Bureau Lets Davis Dam Equipment Contracts

A $2,199,586 contract for five hydraulic turbines to drive five 45,000-kw. generators at Davis Dam power plant has been awarded to the Baldwin Locomotive Works. The vertical shaft turbines have been designed to deliver 62,200 hp. with a 120-ft. head and will operate at 94.7 r.p.m.

Consolidated Steel Corp. of Los Angeles was awarded the contract for three 50x50-ft. regulating gates to be installed in the spillway of the dam. The contract amounted to $168,145.

Davis Dam is under construction by USBR on the Colorado River, 67 miles below Boulder Dam. Construction of the power plant, scheduled to have an installation of 225,000 kw., has not been started.

● Sacramento Municipal Utility District has awarded contracts for purchase of an estimated $70,200 worth of watt-hour meters and 20 trucks costing about $22,000. General Manager James E. McCaffrey reported that the district has some $400,000 worth of materials ready for use when the city begins operating the electric system next January.

● E. R. Hoffman, Seattle City Light superintendent, has requested permission from the municipal board of public works to expend $900,000 from City Light funds for extensions to the utility's underground and overhead system.

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Mallory MSG Capacitor:—Small, compact AC Motor Starting Capacitor that fits almost every mounting bracket or box. Replaces rectangular capacitors with leads, lugs or studs. Each capacitor is packed with complete set of universal mounting hardware and installation instructions.

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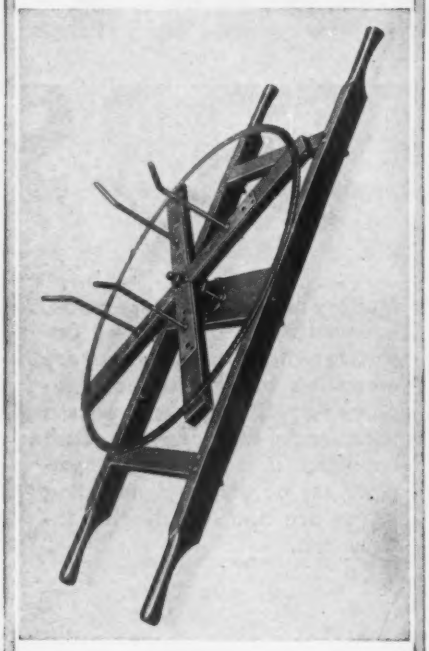

Catalog 17-A Matthews Wire Reel is an inexpensive yet efficient tool for paying out or taking up wire. It is of sturdy construction and can be used for heavy as well as light work. The frame and cross members of turn table are of durable white oak and base, flange and coil arms are of cast malleable iron. Turn table revolves very easily with full coil of wire. Coil arms can be adjusted for coils of wire having inside diameters of 12, 18 and 24 inches. Complete reel finished in olive drab enamel. Base casting and turn table only, can be furnished for truck mounting or store room installation. Frame 70" long x 24" wide, overall height 19", diameter of turn table 42".

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Prepaid in U. S. A.

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COLUMBIA DAMS MENACE SALMON, SPEAKER SAYS

If all proposed dams are constructed on the Columbia River and its tributaries, the salmon run in the Columbia will be virtually destroyed, James H. Cellars, secretary of the Columbia River Salmon and Tuna Packing Assn., told a congressional subcommittee at a Portland hearing.

The run has decreased from 40 to 45% since construction of the Bonneville and Grand Coulee dams, Cellars reported. He said his organization is not against industrial development "when necessary," but he questioned the necessity of some of the proposed dams on the basis of electric power, water transportation and reclamation.

Edison Gives Order for Fourth Unit at Big Creek

Contracts for the turbine and generator to be installed as the fourth unit at Southern California Edison's Big Creek No. 3 plant have been awarded to Pelton Water Wheel Co. and Westinghouse Electric Corp. respectively. The addition will bring plant capacity to 134,000 kw.

The generator will be a 35,000-kw., 450-r.p.m. machine and probably will be delivered about November 1947. The turbine will be a 45,000-hp. Francis pipe reaction water wheel with a relief valve governor mechanism and upper and lower penstock valves; it will be built at San Francisco and delivered about May 1947.

Municipal Signs for Bonneville Power

Eugene, Ore., has signed a 20-year contract for purchase of a minimum of 1,000 kw. of Bonneville firm power, D. L. Marlett, acting Bonneville administrator, announced. The new contract replaces an interchange agreement of August 1940.

Under the new contract, the city may purchase additional power when necessary. The agreement also provides for sale upon request of available dump energy at 2.5 mills a kilowatt-hour to either the city or the administration.

● California Electric Power Co. has been granted state permission to extend service into a portion of Imperial County's Palo Verde irrigation district. The company had been excluded from the area until 1968 under an agreement made in 1943 with the Imperial Irrigation District. The area has built up rapidly since the agreement was made.

OPPORTUNITY

The Public Utilities Board of the City of Alameda, California, is desirous of obtaining the services of a graduate electrical engineer. Starting salary $376 per month. The City of Alameda through its Public Utilities Board operates its own municipal light and power substation and distribution system. Anyone interested in this position should address a communication giving details of education, qualifications and experience to Civil Service Board, Room 304, City Hall, Alameda, California. Qualified applicants will be forwarded an application form which must be filled out and returned to the above address by October 15, 1946. Applicants will then be notified of date of examination to be held to fill the position.

WANTED ELECTRICAL PROJECT ENGINEER

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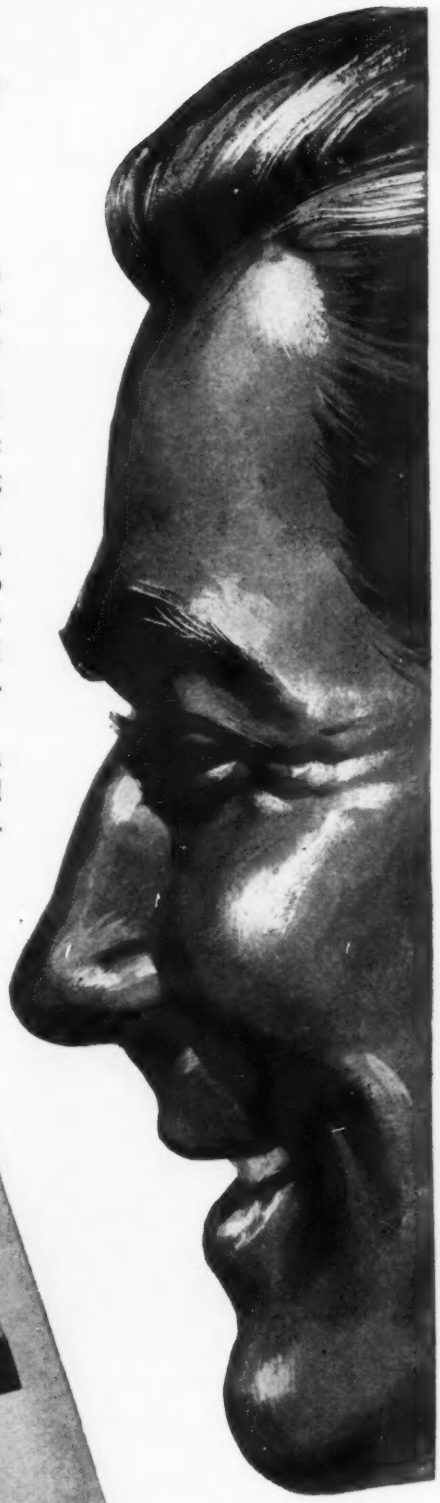
To help increase "Take-Home Savings"

THE Treasury Department has published two new booklets to help you and your employees realize the utmost benefit from your Payroll Savings Plan—benefits proportioned to the extent your employees add to "take home savings" by buying and holding U. S. Savings Bonds.

"Peacetime Payroll Savings Plan" for key executives offers helpful suggestions on the conduct of the Payroll Savings Plan. In addition, it quotes leaders of Industry and Labor and their reasons for supporting the Plan.

"This Time It's For You" is for distribution to employees. It explains graphically how this convenient, easy thrift habit works. It suggest goals to save for and how much to set aside regularly in order to attain their objectives. If you have not received these two booklets, or desire additional quantities, communicate with your State Director of the Treasury Department's Savings Bond Division.

See your Payroll Savings Plan through to maintain your share in America's future. It is sound economics and a powerful force for good today—and tomorrow—as a safeguard for stability and a reserve of future purchasing power—money that is kept within your community.



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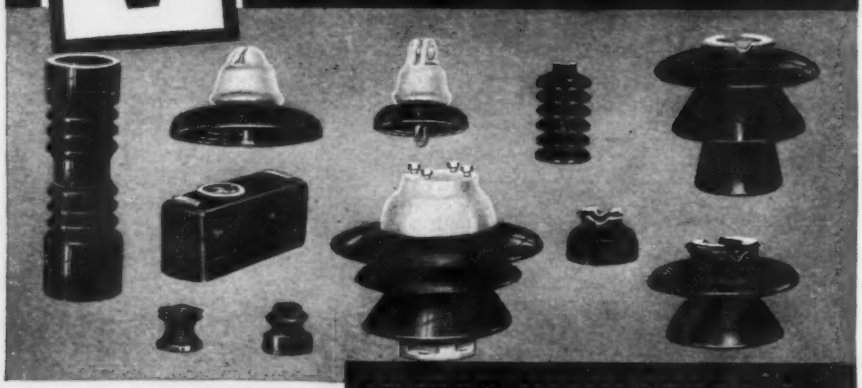

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KELLEMS JUNIOR GRIPS universally used by Electrical Contractors in wiring buildings. Central Stations use them for pulling control cables and underground service cables.

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PEOPLE

made this news

● BRIG. GEN. RICHARD E. MITTELSTAEDT, for 14 years superintendent of the Division of Water of the City of Sacramento, has been appointed by Gov. Earl Warren to the California Railroad Commission, replacing L. Harold Anderson. Mittelstaedt has twice served as adjutant general of the California national guard and took part in both World Wars. His last commission was as commanding general at Fort Richardson, Alaska. Anderson, who was president of the commission, resigned to accept a vice-presidency of Pacific Gas and Electric Co. HAROLD F. HULS, appointed to the commission last November, has been made president.

● FRED OLDENDORF Jr. and GILBERT C. DELVAILLE have been elected vice-presidents of the California Electric Power Co., Albert Cage, president, announced last month. Oldendorf began work with the company in 1929 as a clerk, being transferred to the commercial department in 1931 and the executive department in 1942. He became assistant to the president in 1944, a position he will continue to hold as vice-president. Delvaille, with the company since 1926, has served as commercial clerk, statistician, rate engineer and executive assistant. He will combine his duties as executive assistant with his new post.

● CASH AWARDS totaling $3,165 in Pacific Gas and Electric Co.'s 1945 employee suggestion plan were distributed to the 42 winners at a dinner in San Francisco Aug. 9. Among the top winners were L. H. MILLER, serviceman, Fresno, $175 for an improved fuse assembly; ARNOLD E. HEISE, supervising meter reader, San Francisco, $100 for a program to improve meter reading conditions; R. H. RUSSELL, appliance repair and meterman, Hayward, $100 for a labor-saving method of scaling electric water heaters.

● DR. GILBERT D. MCCANN, formerly with Westinghouse, has joined the staff of the California Institute of Technology at Pasadena. Dr. McCann was graduated from Caltech in 1939 with a doctor of philosophy degree and has made studies of transmission lines, shielding of substations, lightning phenomena and protection. His work at Caltech will include research on guided missiles.

Lawton

● JOHN P. LAWTON became Northwestern district manager for Graybar Electric Co., effective September 1. His headquarters will be at Seattle, where he has served as district sales manager since December 1944. He succeeds J. I. COLWELL as district manager. Colwell, who is retiring, has been Seattle district manager since 1913 and a director of the company since 1934; has served the company for more than 42 years.

● D. H. HANSEN, for more than seven years connected with the Oakland, Calif., electrical inspection department, has been appointed chief inspector, succeeding M. C. SANDLES, who retired July 1.

Perkins

● APPOINTMENT of H. S. PERKINS as Los Angeles district manager for Proctor Electric Co. has been announced by Charles P. Culbert, Western regional manager. Perkins joined the company in 1940 as assistant to the sales manager and last year was appointed assistant general sales manager pending return of Lt. Joseph Tiers from Army service.

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Model "W"

Completely automatic . . . extremely simple, compact, economical . . . three types cover practically every requirement . . .

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4. "E-Z" Hand Type Wire Strippers for stripping solid or stranded wires. Also complete line of hand, foot and electrically operated Wire Strippers.
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Many millions in actual use . . . because no guesswork . . . no worries . . no special tools. Economical . . . dependable . . . connectors can be used over and over. ILSCO CONNECTORS are Underwriters' Approved, 99% pure electrolytic copper, 100% conductive.

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Minimize your voltage losses. Specify scattered transformers to eliminate duplicate conduit runs, and save on power costs.

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TRADE *notes*

Smoot-Holman Makes Organization Changes

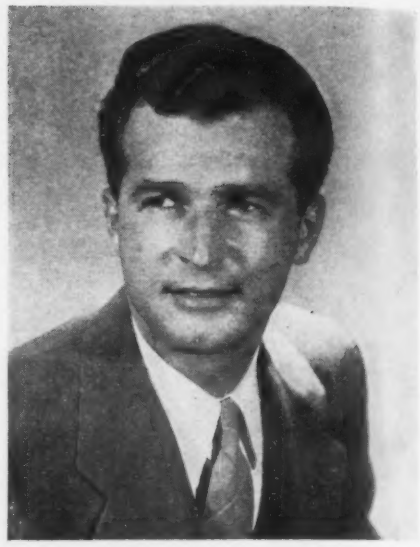
Changes in the Smoot-Holman organization at Inglewood, Calif., have been announced by President C. E. Smoot. William Holman has been appointed vice-president and works manager. L. A. Hobbs is now vice-president and general sales manager and, as a member of the OPA Lighting Fixture Industry Advisory Committee, is dividing his time between the West Coast and Washington, D. C. Fred M. Smoot is secretary and Thomas S. Baker, treasurer. Fred Smoot and L. A. Hobbs have been added to the board of directors.

Smoot-Holman manufactures industrial and commercial lighting equipment. In addition to the main office and plant in Inglewood, it has branches at San Francisco and Seattle.

● FOWLER & JEWELL of Los Angeles is the Pacific Coast representative for the Koiled Kord division of Kellogg Switchboard & Supply Co., and will cover the states of California, Oregon, Washington, Idaho, Montana, Arizona and Nevada. Directing the program will be Walter M. Fowler, Ward E. Jewell and William L. Summer. Nine field representatives have been appointed and, according to R. C. Krueger, manager of the Koiled Kord division, it is planned eventually to have about 20 men in the field. The division makes a line of patented rubber covered electric cord sets molded in a spiral shape and extending to five or six times normal retracted length.

● ROBERT C. GRAY became sole stockholder of Remler Co., Ltd., San Francisco, when he purchased the stock of E. G. Danielson, retiring president. Gray, former vice-president and general sales manager, is president of the reorganized company. Founded in 1918, the company is one of the nation's oldest electronic and plastic firms. It supplied the Army and Navy with precision equipment.

● STERLING Electric Motors Inc. of Los Angeles, manufacturer of variable-speed and geared motors, is spending some $600,000 for plant expansion, according to Carl E. Johnson, president. A 22,000-sq. ft. unit will be added to the company's present three-acre plant and manufacturing processes will be re-equipped throughout.



Flint

● RAYMOND P. FLINT has joined the organization of Russell & Co., manufacturers' representatives, with headquarters in the Western Merchandise Mart in San Franciso. He has a background of eleven years in engineering and sales of heating; was formerly sales engineer for the General Air Conditioning Co. of Oakland. During the war, he was associated with George G. Sharp, naval architect, as electrical heating and ventilating engineer. In his new position, he will have charge of sales promotion for Electromode domestic and industrial heaters.

● KENNETH B. SCHUMANN will replace W. E. Young as Rocky Mountain representative for Trico Fuse Mfg. Co. of Milwaukee, Wis., manufacturer of electrical equipment, lubricating devices and air guns. Schumann is a graduate electrical engineer and for more than eight years has operated his own electrical contracting business in Denver. His territory includes Colorado, Wyoming, New Mexico, Utah and most of Montana.

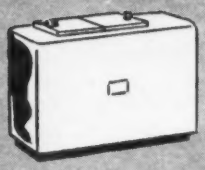
● C. S. ALLEN has been elected vice-president and general manager of the Sawyer Electrical Mfg. Co. of Los Angeles, according to announcement of President George E. Johnson. Allen started with the company as chief engineer and more recently had been assistant general manager.

● WHEELCO INSTRUMENTS Co. of Chicago has appointed Farnes & Margig Inc., 417 N. E. Couch St., Portland, as its sales and service representative for the state of Oregon.

● NORTHWEST ELECTRONICS, which started business in Spokane last year, has expanded its space at N. 104 Monroe to provide a sales room, offices and storage for electrical equipment.

If you Manufacture...

AUTOMOBILES



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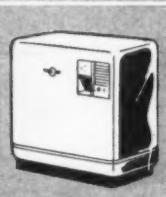

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Fuses, Oilers, Clip Locks and Fuse Pullers

KNOX PORCELAIN CORP.
Electrical Porcelain

● Lt. Samuel B. Schurgin has returned to Phoenix, following four years in the Army, and has reopened his business, the Arizona Power & Light Co.; at 608 S. Central Ave. Before the war, the company distributed fluorescent lighting and electrical specialties, but Schurgin plans to expand into allied lines. He closed the business when he enlisted as a private in June 1942. He was sent to officers candidate school at Fort Warren, Wyo., was commissioned in December 1942. For the past two years, he has been at the Granite City, Ill. engineer depot, where he served as control officer.

● Harold W. Squires and William Marshall have taken over the Unistrut Service Co. for Northern California and will conduct this business from 1095 Market St., San Francisco. In addition to a stock of Unistrut and fittings, they have shop facilities for storage and fabrication of parts and will handle any contract in its entirety, they report. Squires and Marshall also are distributors for Lyon kitchen products. Squires formerly was with Kimball Crough Pump division of Victor Equipment Co. and Marshall was with Pacific Electric Mfg. Co.

● French, Hermes & Thomas will start the manufacture of frozen food locker equipment, refrigerated photo developer coolers, plastic heat exchangers, and a dome type residential heating unit, at a new plant in Chula Vista, according to Ralph French of French's Refrigeration Co. of San Diego.

● Commercial Appliance Co., a new firm featuring commercial refrigeration and lighting at 227 N. Division St., Spokane, was organized recently by Fred Fisher, formerly of Washington Electric Appliance Co. Associated with Fisher are Virgil H. Brown and Van Johnston.

● A Spokane office and warehouse have been established at S. 124 Wall St. by the Pacific Coast Heating and Appliance Co. of Seattle and Portland, wholesale distributor for heating equipment, home appliances, hardware and paint.

● Pacific Coast Heating & Appliance Co. of Portland has been appointed distributor for Presteline electric ranges manufactured by the Pressed Steel Car Co. Oscar Edlund, for many years with Arnold Kuhnhausen Co., is the local representative.

● Sterling Furniture Co., San Francisco, has established a branch at 1800 Telegraph Ave., Oakland. The new store has a large appliance department.

CHANCE (TIPS) HOT TAP CLAMPS
hold tight without sticking -

PERMA-GRIP TAP CLAMPS . . .

Make permanent or temporary hot tap connections that are dependable and economical. They stay put without vibrating loose, and yet they can be removed or replaced at any time because operation of the eye screw is unaffected by corrosion and can be readily unscrewed with a Clamp Stick. They are made for tapping to aluminum, copper, or steel conductors and are available in a complete range of sizes to meet all requirements.

- HIGH CURRENT CAPACITY
- HIGH MECHANICAL STRENGTH
- HOLD TIGHT WITHOUT STICKING
- THREE POINT CONTACT
- POSITIVE PRESSURE JUMPER CONNECTION
- AVAILABLE IN ALL TYPES AND SIZES

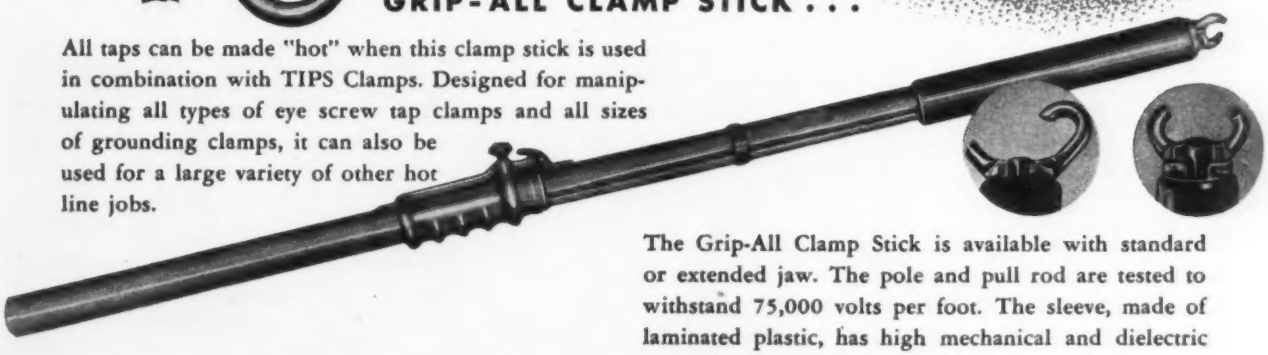
SNAP TAP CLAMPS . . .

Provide both a strong, permanent connection and a rapid "disconnect." The Snap Tap Clamp is applied to the line with a quick snap effect, using any Chance Clamp Stick, and is tightened by turning the eye screw. Available for all types of connections. The jaws of the Snap Tap Clamp will take conductors ranging in size from No. 8 solid copper to 4/0 stranded copper.

Duck bill, compression tap wire terminal, and enclosed thread eye screw are made of high strength bronze.

GRIP-ALL CLAMP STICK . . .

All taps can be made "hot" when this clamp stick is used in combination with TIPS Clamps. Designed for manipulating all types of eye screw tap clamps and all sizes of grounding clamps, it can also be used for a large variety of other hot line jobs.



The Grip-All Clamp Stick is available with standard or extended jaw. The pole and pull rod are tested to withstand 75,000 volts per foot. The sleeve, made of laminated plastic, has high mechanical and dielectric strength. Metal fittings are aluminum and bronze.

Write for detailed information about these indispensable maintenance tools

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PROFILES *of the month*

William Holman (above left) and Leonard A. Hobbs, recently given new assignments in the Smoot-Holman organization at Inglewood. (See page 132.)

Charles A. Mackenzie (right) named Westinghouse Supply representative in western Nevada and northeastern California, with headquarters at Reno. He served 22 months in the Navy as field lighting engineer; received the Legion of Merit for work on Army-Navy lighting in the Alaska-Aleutian theater.

Among Seattlites at the NWEL & PA executive session in Portland were (below) F. T. Brien, Graybar; O. A. Alderman, Bussmann Mfg. Co., R. B. Lane, Industrial Electric Co., and president of the Seattle Electrical Contractors Assn.

HORSEPOWER...*goes to College*

Among P. G. and E. Co.'s more than 133,000 stockholders are 234 educational institutions located all over the United States.

This means that horsepower, generated from the waters of the High Sierra and sold to users in Northern California, finally finds its way to schools and colleges in the form of dividends paid out of earnings.

Traditionally conservative investors, these institutions recognize the progressive spirit of Northern California—its business, industry and people. Their confidence in us to produce and grow is gratifying. It shows faith in the American way of life, where business-owned and operated utilities, subject to regulation for the greatest public interest, help create prosperity and a higher standard of living for the millions of people living in the areas they serve.

P·G·and·E· PACIFIC GAS AND ELECTRIC COMPANY

EW—109-946

Modern, postwar lighting installation at office of San Rafael Land & Title Co., consisting of 4-tube, continuous URC fixtures, maintaining 65 footcandles illumination at desks.

"I See Health, Happiness and Success"

Health

. . . because good office lighting reduces eyestrain, which adversely affects the whole system—muscles, heart, nerves, brain.

Happiness

. . . because good office lighting is cheerful, makes work easier and faster, lessens fatigue and improves morale.

Success

. . . because good office lighting helps guard against inaccuracies and mistakes caused by improper seeing. Happy, healthy employees appreciably lower personnel costs and do better work.

Scientific management appreciates dollar-and-cents value of good office lighting. For advice and information consult your local electric power company.

PACIFIC COAST ELECTRICAL ASSOCIATION

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